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ASSOCIATION.

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## MR. S. PALGRAVE PAGE. PRESIDENT, 1913.

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UNDOUBTEDLY there is no one more popular or more esteemed amongst the members of the British Dairy Farmers' Association than S. Palgrave Page, the genial President of 1913.

For many years Mr. Page has taken the keenest interest in the work of the Association, his sole aim being always to advance its influence in dairying generally, so that much of the popularity it now enjoys may be attributed to his persistent efforts. As chairman of the Finance and General Purposes Committee, Mr. Page's work for the British Dairy Farmers' Association has been untiring and ever increasing, so that the present sound financial position of the Association is mainly due to his practical judgment and guidance.

Perhaps it may not be commonly known that Mr. S. Palgrave Page is senior partner in a well-known firm of produce brokers in the City of London, and consequently he is always in close touch with matters pertaining to dairy produce. Naturally, his advice and commercial capabilities have therefore been of the greatest service to the Council.

Those members who attended the Conference in Ireland last summer can testify to the wonderful organisation and precision with which every detail was carried out under his guidance.

Mr. Page cannot perhaps be classified as a dairy farmer pure and simple in the accepted sense of the term, but he keeps a small herd of choice Jersey cattle at his residence, Mottingham Hall, besides a loft of Dragoon pigeons, of which he was at one time a large and very successful exhibitor. He has been four times President of the National Peristeronic Society, one of the oldest Columbarian Societies, and was one of the founders of the Dragoon Club, which annually gives several of its gold medals for competition at the Dairy Show. He is also a Liveryman of one of the oldest City Companies, viz., the Goldsmiths.

With the expiration of Mr. Page's Presidentship the lease of the present offices of the Association in Hanover Square terminated; and mainly due to his efforts more extensive and spacious premises in Russell Square were acquired, where it is the hope of the Council that the guiding influence and practical knowledge of S. Palgrave Page may be as keenly evident as they have been during so many years past.



**MR. S PALGRAVE PAGE**  
*PRESIDENT OF THE BRITISH DAIRY FARMERS' ASSOCIATION*  
**1913.**



THE LATE SIR GEORGE BARHAM.

## MEMOIR OF THE LATE SIR GEORGE BARHAM.

By the death of Sir George Barham, which took place on the 16th of November last, within six days of the completion of his seventy-seventh year, the dairy industry of this country has lost its leading representative and the British Dairy Farmers' Association a former President and one of its oldest and most distinguished members.

The career of the late Sir George was intimately bound up with the work of the Association. Becoming a member within a short time of its formation, he was elected to a seat on the Council in 1880, and for a period of more than a generation maintained an active interest in its affairs, promoting its interests by tongue and pen, and contributing by his powerful advocacy to its recognition by the highest in the land and to the attainment of the prominent position it now occupies as the leading dairy association of the Kingdom.

His life may be said to be a record of the rise and progress of British dairying, for he lived to see it develop from an unconsidered adjunct of the farmer's business to a huge and highly organised industry, which has been well and truly described as the sheet anchor of British agriculture—and in the process he took by no means a small part.

The early days of the British Dairy Farmers' Association were times of difficulty. The annual Shows at Islington and elsewhere, successful as they were as exhibitions of stock, produce and implements, and of the highest value from an educational point of view, were not always the financial success which they afterwards became, and on more than one occasion it was left to the devoted body of men who promoted these exhibitions to put their hands in their own pockets in order that the obligations of the Association might be promptly met. But success eventually attended the efforts of these pioneers, of whom Sir George was not the least conspicuous; the industry was awakened, its national importance recognised, and from being a drain upon the funds of the Association, the London Dairy Show has become a considerable source of revenue, whilst it has established itself as one of the most important exhibitions of its kind in the world, attracting visitors from the four quarters of the globe.

It is, perhaps, to a past generation that the work of Sir George on behalf of the dairy industry will be best remembered, and one cannot but recall the names of some of those who were prominently associated with him in his early efforts. Many have passed away—among them the Rev. Canon Bagot, Professor J. Prince Sheldon, Mr. Edmund C. Tisdall, Mr. G. F. Rounieu and the late Lord Vernon. Others, happily, are still with us—the veteran George Gibbons, Professor Carroll, Professor Nuttall, Professor Long, Mr. Holmes Pegler, Mr. Alfred Tisdall and Mr. John Welford—to mention but a few whose names are familiar to all in the dairying industry. Such was the combination of business talent and scientific knowledge which laid the foundations of the modern system of dairying in this country.

The late Sir George's active connection with the industry dates back to the year 1858, when, striking out a line other than that marked out for him, he started in business on his own account in the City. His success was immediate, and to his retail business he soon added that of a wholesale trade. He was quick to recognise the advantage of drawing supplies from outside the limits of the metropolis, and by the year 1861 he had established the Express Country Milk Company, bringing in milk from distances previously unheard of. The cooling of milk was not regarded with favour in those days, but when a few years later he was addressing the Food Committee of the Society of Arts on this subject he had to a large extent overcome that prejudice, the excellent condition in which the milk arrived and its improved keeping qualities being readily appreciated by those who had to handle it. It was about this time that the Lawrence Capillary Refrigerator was introduced, and by its use the problem of bringing milk from long distances was solved.

The advantage of the country milk traffic was soon to be demonstrated in a striking degree, for the outbreak of the cattle plague in 1865 shut off the supply of milk within the metropolis, and it was due to the remarkable energy of Sir George (then Mr.) Barham—who, having secured specially favourable rates from the railway companies, obtained supplies of fresh milk from all parts of the kingdom—that a milk famine was averted. Many a London dairymaid lost the savings of a lifetime, but not a soul went short of milk by reason of that visitation, and farmers found a much more profitable market for their commodity than they had previously possessed.

By the year 1880 the supply of utensils by the firm had reached such dimensions that a separate company was formed, under the title of "The Dairy Supply Company, Ltd." to carry on this and the wholesale milk branch of the business, the name of the parent company being changed to the "Express Dairy Company, Ltd." in the following year. Sir George scoured the Continent for all that was best in the way of dairy appliances, and in 1885 secured for his firm the sole agency for the first practical cream separator, the invention of Dr. de Laval, which, with the "Alfa" device, introduced in 1891, has done so much to revolutionise the dairy industry. The working dairies equipped by him were a great feature at the various agricultural shows and were in much demand by reason of the educational value of the demonstrations given.

It was not only in this country that he carried on his propaganda work in the cause of hygienic and scientific dairying, and as long ago as 1883 he had equipped a model dairy at the Great Centennial Fair at St. John's, New Brunswick, with the late Professor Sheldon as lecturer and demonstrator. Eight years later he sent out a fully-equipped working dairy under the direction of Mr. John Benson, assisted by the late Miss Amy Barron, to the International Exhibition held at Kingston, Jamaica.

Previous to that he had directed his attention to dairying conditions in India, which were sadly in need of reform. His efforts to

interest the India Office were without avail, and in 1889 he decided to send out a commission on his own responsibility under the charge of the late Mr. H. A. Howman, a member of the Council of the British Dairy Farmers' Association, which, with a complete outfit of the most recent dairy appliances made an itinerary of the European centres, and so demonstrated the value of a hygienic system that the Government eventually took the matter up. The result was the establishment of the military dairy farms which have done so much for the health of the British troops and the population generally of our great dependency.

Sir George's interest in promoting the purity, both commercially and from the hygienic standpoint, of milk was unceasing. He set an example in his own business by securing the services in 1884 of Mr. Harald Faber, of the Royal Danish Laboratory, Copenhagen, as analytical director, and in the following year by the appointment of Dr. (now Sir) Shirley Murphy as sanitary director. His model farms and dairies led the way to the great improvement which has since taken place in the carrying on of our milk supply.

It was natural that he should be greatly moved by the evils which had sprung up in connection with the fraudulent trade in butter substitutes, which, 30 years ago, had reached enormous dimensions. At that time the substance known as "butterine" was being imported to the extent of nearly 850,000 cwt.s. per annum, the value being put at over £3,000,000. It was known, however, that this represented only a small proportion of the actual traffic in the spurious article. The effect on the British dairy farmer was being seriously felt, butter production was greatly curtailed, and large quantities of milk being diverted to cheese-making, the price of the latter article was brought down, it was estimated, by no less than 25 per cent. It was under these circumstances that Sir George brought the matter before the meeting of the British Dairy Farmers' Association at the Dairy Show of 1895, and at the Council meeting in December he submitted a strongly-worded resolution on the subject. It was decided that some definite proposals from the Association for an amendment of the law should be made before further action was taken. Sir George lost no time, and at the next meeting, a month later, he came prepared with a draft Bill, with the suggested title of "The Butter Frauds Prevention Act," embodying his views. This was in due course revised by the Committee and afterwards approved by the Council. The Bill as originally framed was very drastic—not too much so in the opinion of many. Sir George was for the prohibition of any description of which the word "butter" formed a part, and he desired, moreover, that the distinctive colour of butter should be banned. He suggested that if colouring was used at all it should be pink, green, or black, quaintly claiming a preference for black, on the ground that nobody would eat a substance resembling harness paste. The colouring clause was however waived, it being felt that its retention in any Bill would imperil its chances of passing into law. In the meantime Sir George addressed meetings in various parts of the country and aroused public opinion in favour of an alteration of the

law. Bills were brought in by Mr. Conway in the House of Commons and Lord Vernon in the House of Lords; and finally the best features of the three Bills were embodied in what eventually found its way on the Statute Book as the Margarine Act of 1887.

It was in 1885 that the proposal to increase the railway rates on the carriage of merchandise was mooted, and the British Dairy Farmers' Association at once appointed a Committee, with Sir George as its Chairman, to watch the interests of the milk traffic. The revised schedule appeared four years later, and was found to seriously affect the industry. The rate of increase ranged from 140 per cent. on the Great Western Railway to 255 per cent. on the Great Eastern, and it was computed that the additional revenue to the companies would amount to not less than £350,000 a year. The increased cost to the average dairy farmer was estimated at £6 per cow per annum, or £1 per acre. A Board of Trade inquiry was held in 1890, with Lord Balfour of Burleigh as Chairman, to hear objections on the part of traders. The British Dairy Farmers' Association and the other Dairy Associations throughout the kingdom nominated Sir George as their representative to give evidence before the Committee. His presentation of the case for the dairy industry was a masterly effort. The railway companies were represented by four Q.C.'s and other counsel, whilst the agricultural interests were in the hands of two junior members of the Bar. It was stated at the time that the railway companies were spending £1,000 a day on counsels' fees. The premier agricultural Society – the Royal – contributed two sums of £50! Sir George, however, more than held his own, and his striking array of facts and figures obviously impressed the Committee.

At the following Dairy Show he read a paper on the subject, which was widely circulated and discussed. A few weeks later he received an invitation from Sir Michael Hicks-Beach, the President of the Board of Trade, to meet him in conference with the representatives of the railway companies. On December the 1st, 1900, the meeting took place. Sir George stated his case: that of the companies was put by the General Managers of the Great Western, the London and South Western, and the Great Northern Railway Companies. In the end Sir Michael said that "Mr. Barham has sustained his objections, and the rates must be considerably reduced." The reduction was not effected without much further effort, but the persistency of Sir George was rewarded in 1892 by the rates being restored to the old level, which were more favourable than those on any other article of commerce, and at that they remained until the year of his death.

The administration of the law in regard to the milk supply called for his intervention on several occasions. In 1874 he gave evidence before a Committee of the House of Commons appointed to inquire into the working of the Adulteration Act, 1872, and he was largely instrumental in securing the amendment of the Act which pressed unjustly, in its original form, on the trade. He was keenly alive to the necessity of the suppression of fraudulent practices, but he was not prepared to leave the industry to the tender mercies of the analytical

profession, among whom much misconception existed as to the difficulties and the varying conditions of milk production. In a spirited address which he delivered at the Conference on Food Adulteration, held at the International Health Exhibition in 1884, he refuted many of the statements made to the detriment of the milk supply, and his defence of the industry called forth the approbation of one of the highest scientific authorities in the person of Dr. Bell, the chief of the Government Laboratories at Somerset House.

The question of the milk standard was, however, a continual source of contention, and when, in 1900, Mr. Walter Long, then President of the Board of Agriculture, appointed a Departmental Committee to inquire into the subject, Sir George was invited to become a member. It was a wise choice; nobody could speak with greater knowledge on the question. He had for years previously farmed on a somewhat extensive scale, and he had handled more milk than any man in the kingdom. Moreover, he had acquired, for a layman, a comprehensive knowledge of the scientific side of dairying, which enabled him to meet on their own ground many of the expert witnesses who came before the Committee. The inquiry was a lengthy one, the examination of witnesses extending over 8,000 questions and answers. In the result, the Committee were divided, Sir George finding himself in a minority of one. The report issued by him practically embodied the information elicited in the course of his masterly examination of the witnesses. It was a great effort, involving an immense amount of labour, but its conclusions were unassailable and it received the support of practically all the dairy associations in the kingdom and of the agricultural Press.

The regulations subsequently framed by Mr. Hanbury, who had succeeded Mr. Long as Minister for Agriculture, did not entirely embody the recommendations of Sir George. There were obvious difficulties in the way of a seasonal standard, which Sir George considered to be necessary if, as he feared, the limits laid down were to be interpreted as an arbitrary standard. But it is evident that Mr. Hanbury was largely influenced by the Minority Report in making his regulations, and this was more apparent in the circular which he afterwards addressed to the local authorities. That the adoption of the recommendations of the majority would have inflicted grave injustice on many honest farmers and dairymen experience has abundantly proved. To the "standard" itself, regarded as a *presumptive* limit, little exception can be taken, and this was Sir George's own view; but the misinterpretation of it by so many benches of magistrates unfortunately continues to be a source of grievance to many whose *bona fides* are beyond question.

Sir George's interest in dairy education was of a pronounced character. He was advocating travelling dairy schools before the British Dairy Farmers' Association in 1884, and in 1885 was stirring up the Royal Agricultural Society on the subject of rural education. He had previously delivered two lectures of a scientific nature before the Dairy Produce and Minor Food Products Association at South



Kensington, and was appointed an Examiner to that body. He was frequently called upon to examine the students of the migratory dairy schools, and when the new range of model dairies, which he erected at Hampstead for the Express Dairy Company, were completed he placed them at the disposal of the Bath and West and Southern Counties' Society for their Home Counties Dairy School, which was honoured by a visit of H.R.H. Princess Louise, who distributed the prizes to the successful students. He was also associated with the work of the British Dairy Institute at Reading, serving for some years on the joint committee with members of the University College.

As a member of the Council of the British Dairy Farmers' Association, he served as Chairman of the Finance and General Purposes Committee, and was a delegate to the Central and Associated Chambers of Agriculture and a representative on the Tuberculosis (Animals) Committee. He was Chairman of the Conferences which visited the Channel Islands in 1891, Denmark and Sweden in 1897, the Home Counties in 1902, and the Midland Counties in 1908. He took part in most of the earlier Conferences, and himself entertained the members at his country home at Wadhurst on their visit to the Southern Counties in 1907. The unique place occupied by him in British dairying was recognised by the British Dairy Farmers' Association in their election of him as a Vice-President in 1901 and President in 1908, this being the first occasion on which the selection had been made from among the Council itself.

Among the dairy trade of London, Sir George was their recognised leader and champion. He was one of the founders of the Metropolitan Dairymen's Society in 1873, and of the Dairy Trade and Can Protection Society in 1890. He was also a founder of the Metropolitan Dairymen's Benevolent Institution in 1874 and presided at the Anniversary Festival in 1880. In furthering the interests of the trade he addressed meetings in all parts of the metropolis, and as recently as the end of 1911 he was presiding at a mass meeting of dairymen at the Holborn Restaurant in connection with the price of milk.

The honour of knighthood was conferred upon him in 1904. He was a J.P. for Middlesex and East Sussex, and served the office of High Sheriff of the former county in 1907-8. He was the first Mayor of Hampstead to be elected from outside the Council. For a time he served on the Vestry of St. George's, Bloomsbury, and he was twice elected a member of the East Sussex County Council.

In reviewing a career of remarkable activity, extending over a period of more than half a century, it is impossible to do more than touch briefly upon some of its outstanding incidents as they affect the great industry to which he gave his life and energies. He has left behind him the mark of a striking personality, and those who admire his work most will also render tribute to his qualities of heart and his charm of manner and person. Fluent in speech, with a fund of quiet humour, he was a welcome addition to any assembly, whilst his courtly demeanour and delightful old-world touch, coupled with benevolent instincts of a rare order, stamped him as a real type of the fine old English gentleman, to be loved and honoured.

## ECONOMICAL FEEDING OF DAIRY CATTLE.

By Wm. GOODWIN, M.Sc., Ph.D., Midland Agricultural and Dairy College.

ONE of the chief factors in the profitable production of milk is economical feeding, and at the present time a considerable amount of attention is being given to the subject in this country. The high price of feeding-stuffs and the difficulty experienced when the consumer is asked to pay more for the milk, makes it essential that no effort should be spared by the dairy farmer to produce milk as economically as possible. The enhanced prices of cows must also be taken into consideration, particularly as under existing conditions there does not seem to be much prospect of a larger supply of good animals.

The formation of milk-recording societies, which it is gratifying to notice has begun in different parts of the country, will do much to give exact information on some of the main factors to be considered in milk production. Whilst milk-record societies are intended first of all to assist in the breeding of cows with a high milk yield and to get rid of those that are not giving a profitable quantity of milk, they have also a splendid opportunity of showing the farmer at what cost for food he is producing milk, and whether or not the ration that he is feeding is the most economical one under the conditions he finds himself. There can be no doubt that a milk-record society which does not give a prominent place to the cost of feeding the cows fails to give to its members the full benefits that are to be obtained. When, as is usually the case, a "tester" or "recorder" is employed by a milk-record society, his duties, in addition to checking the weighing of the milk and testing individual samples at regular intervals, are to ascertain what foods are being used and in what quantities, and afterwards to estimate at what cost for food the milk is being produced on the different farms. It will then be seen whether the most economical ration is being fed and, if not, suggestions for its improvement can be made. Some very valuable information has already been collected in this way both at home and abroad, and reference will be made later on to some recent investigations carried out in this country.

Economical feeding does not by any means imply parsimonious or insufficient feeding, but the use of a ration which will give a maximum amount of milk at a minimum cost and will not exercise a detrimental influence upon cow or calf. Experience shows that whilst there are undoubtedly cases where dairy cows are not receiving enough food to enable them to produce the maximum amount of milk they are capable of producing, there are, nevertheless, instances of rations which are not economical, either because they are excessive in quantity or are compounded in an unscientific manner.

In dealing with the dairy cow, as with practically all other animals kept on the farm, it is well to recognise that the ordinary ration consists of two portions. The first is that which goes to maintain the body of the animal at a certain level so that she neither gains nor loses weight. In addition to this maintenance diet, as it is usually called, there must be sufficient food to produce as much milk as the cow is capable of giving at that time. If there is not enough for this purpose, then the best method of feeding is not being adopted.

Under ordinary farm conditions it is never likely that a cow will be given less than a maintenance diet or ration, but cases are met with where the food is insufficient to make good the losses which are brought about by the production of milk. When the ration is deficient in quantity or quality the body tissues (flesh and fat) of the animal are called upon to give up some of their substance which is then converted into milk. In the case of heavy-milking cows this is often seen to be the case when the flow of milk is at the maximum, and the animal must then of necessity lose weight, for she is producing milk at the expense of her own body, and the greater the deficiency in the ration the more rapidly will the animal sink as the provision of milk for the calf is a more powerful influence than the preservation by the cow of her own body substance. The aim of the dairy farmer should, therefore, be to feed such a ration that each individual cow is able to produce the maximum amount of milk of which she is capable and at the same time not show any decrease in body weight. As in most cases the cow has to provide material for the calf which is growing in her body as well as for the milk, it will be understood that this factor must also be taken into consideration when discussing the amount of food which she requires. An equally important point to recognise is the fact that the mammary gland is unable to utilise more than a certain amount of food material and to convert it into milk. There is for each cow a maximum capacity in this respect, and this maximum is found to differ considerably in individuals.

When a cow receives more food than she can convert into milk the excess is stored in the body (chiefly in the form of fat), and this reserve material may be, and frequently is, of great service later when the flow of milk is at the maximum and the food fails to provide sufficient for the requirements of the mammary glands. In the case where high feeding is in operation with the object of fattening the cow and selling her out of the herd when dry, the quantity and quality of the ration must also be carefully considered, for it is questionable whether it pays to feed expensive concentrated foods in excessively large amounts. Liberal feeding is of course essential, but seeing that the animal is putting on fat almost entirely, the use of nitrogenous foods beyond certain limits is usually uneconomical. It is conceded, naturally, that the manure made by animals receiving these rich feeding stuffs is more valuable, but the losses which occur during the making of the dung are so great, particularly in the case of the nitrogen, that it is probably more beneficial to rely upon the nitrogen of an artificial manure to make good the deficiency.

Enough has already been said to show that a herd of cows should be treated as individuals, and to each one there should be given the amount of food (particularly in the case of concentrated feeding stuffs) necessary to produce the maximum yield of milk. In practice it is well-nigh impossible to follow this plan, but much may be done by dividing the cows into groups according to the quantity of milk they are giving. It is not suggested that any elaborate arrangements are necessary when feeding cows according to their milk yield, whether grouped together or singly, but the practice adopted in some herds of giving the same ration to all animals and then adding meals or other concentrated foods in proportion to the quantity of milk given by the individual cows has much to recommend it. By means of a suitable measure the concentrated foods can rapidly be served out, and once the capacity of the measure has been determined by weighing the contents, no further weighing is necessary as long as the same or very similar mixture is used. Nothing, however, can compensate for the lack of the farmer's personal attention, even though the milk is carefully weighed, for there must be somebody to judge whether the ration that is being fed is one upon which the cow is losing flesh or becoming fat.

It is not necessary to go deeply into the discussion of the different nutrients that come into consideration when dealing with foods or rations, but the following brief account will serve to make the position clear. Food constituents or nutrients are conveniently divided into carbohydrates, oils or fats, protein or albuminoids, crude fibre and mineral matter. There is, in addition, a certain amount of water, which, in the case of an ordinary dry feeding stuff, is about 12 per cent., but may be as much as 90 per cent. in roots. The grouping together in the above manner of substances of similar feeding properties is one of convenience, and considerable differences are found between members of the same groups in some instances.

The carbohydrates are such substances as starch, sugar, gum, digestible cellulose. This group contains no nitrogen and is therefore incapable of forming flesh or the nitrogenous constituents of milk. Most home-grown foods contain large quantities of carbohydrates. In the animal body excess of carbohydrates goes to form fat.

Oils or fats resemble carbohydrates in not containing any nitrogen, but they are more concentrated nutrients as regards the energy which they contain. About two and a quarter times the feeding value of carbohydrates is contained in the oils. They are also stored in the body in the form of fat. Only a relatively small percentage of oil is found in the ordinary home-grown foods.

Protein or albuminoids are characterised by containing nitrogen, and as flesh and the casein and albumen of milk also contain nitrogen these constituents of the food cannot be dispensed with in fact the functions of the body are not carried on properly in the absence or scarcity of protein. Excess of protein is converted into fat, but as fat contains no nitrogen it is manifest that to employ large quantities of expensive nitrogenous foods for fattening purposes is poor economy. It must be pointed out, however, that rapid fattening, when this is the

object, depends upon a somewhat lavish use of concentrated feeding stuffs.

Crude fibre being largely indigestible has not a direct feeding value, but it fulfils a valuable purpose in giving bulk to the food and in promoting the passage of it through the intestine. When a cow is fed upon a ration that is not sufficiently bulky she does not experience the feeling of satisfaction which should follow a proper meal, and in consequence she is restless and continually on the search for more food.

Mineral matter or ash is another indispensable constituent of the food, for it is required in the building up of the skeleton of the young animal, and in the adult a shortage of these mineral substances is followed by serious consequences. Generally speaking a well-balanced ration made up of several foods is not likely to contain less than the requisite amount of mineral matter, although cases are recorded of cow and calf suffering by reason of a deficiency.

Formerly much stress was laid upon the relation of the nitrogenous part of the food to the non-nitrogenous, but more exact trials seem to show that the question is not as important as was previously believed, and that if any animal receive an adequate supply of protein, the other food constituents will be utilised satisfactorily. At a later stage in this article a return will be made to this particular point, for it is very essential when considering economy to keep down expensive nitrogenous foods to the level at which they give a profitable return. On the other hand, considering the importance of nitrogen to the animal body, there must be no risk of supplying an insufficient amount.

Another important consideration enters into the composition of a ration and that is its palatableness. Of late years this question has been studied very closely and the results of direct experiments have supported the findings of practice, that when an animal relishes its food it does better than when it eats unwillingly. The use of condiments has no doubt arisen from the desire of the farmer to see his cattle clear up their food, and to some extent these spices, &c., may have a beneficial effect in inducing the animals to eat a ration that is lacking in flavour or actually distasteful. Good wholesome food requires no condiments, and its effect will not be improved by any high-priced or extensively advertised article of this description. A sprinkling of salt can, on the other hand, be highly recommended, and it can be obtained at a fraction of the cost of condiments.

It must not be forgotten that an animal is apt to tire of a monotonous diet, although it may not be unpalatable, but when it is noticed how frequently the quantity and quality of milk improve when a change is made in the ration it is probably a fair indication that the change is appreciated.

Whilst frequent changes of diet are somewhat difficult to arrange on an ordinary farm, it is undoubtedly beneficial to the health and milk-producing power of the cows to introduce as much variety as possible into the ration. A mixture of various meals or cakes is likely to do better than a single substance, and as light is thrown upon the complex

process of digestion it will probably be shown that there is a reason for the improvement.

The substitution of one kind of oil cake for another can usually be arranged for by making judicious contracts at the right time, and a study of market prices will often enable a farmer to make use of a cake or meal that is selling at a relatively cheap rate. Home-grown corn may be ground and fed in some years with more profit than would be the case if it were sold and concentrated foods purchased.

Treacle is a feeding stuff that is valuable on account of its taste and also as a food, and for the sake of economy, if not for convenience, it is preferable to purchase the article itself and not in the form of one of the numerous "sugar" feeds which are nowadays so extensively advertised and which depend almost entirely upon the treacle they contain for their food value. The common practice of thinning down the treacle with hot water and pouring it over the mixed chop and meals is to be recommended, more particularly when there is a scarcity of roots.

In every ration there is a certain proportion of the material that cannot be digested and so is not capable of being incorporated with the body. The percentage of indigestible matter varies and depends upon a number of factors, the chief amongst which are the origin of the food, the method of preparation, the proportions in which the nutrients are present, the animal, &c. As a rule the food constituents, with the exception of the crude fibre, may be said to be easily digested in the case of oil cakes, cereal and leguminous seeds, meals, roots, whilst those in hay and straw are not so digestible.

Another factor to be considered in this connection is the origin of the food constituents, for it is now known that for feeding purposes or for the production of milk the carbohydrates, protein, &c., of oil cakes, cereal grains, peas, beans, grass are more valuable than those in coarse fodders such as hay or straw, or foods which are distinguished by containing a large proportion of crude fibre. These differences have not so much to do with the food constituents themselves as with the greater or less difficulty which the animal experiences in masticating or digesting them.

Regarding food for the moment as a store of energy which on digestion and assimilation becomes available to the animal for the formation of body tissue (flesh and fat) or the production of milk, or for the performance of mechanical work, it is easy to realise that if much energy has to be expended in getting food incorporated into the body the net return is less than in the case where the food is easily masticated and digested. This fact, therefore, has led to the determination of what may be termed the "value" of a food, that is to say, how it compares with others in regard to the energy which is utilised in putting the nutrients into a form ready for assimilation. A recognition of the varying "values" of foods leads to the position that for accurate information regarding any feeding stuff, not only must the digestible constituents be known, but also what deductions must be made for energy spent in mastication and digestion. As the table given on page 20 shows, there are considerable differences in the "value" of the common

feeding stuffs, but it is only in cases where the material is hard and resistant, *e.g.*, straw, that any notable allowance has to be made. Most of the oil cakes, cereal grains, leguminous seeds, are "full value" or nearly so, whilst hay and straw have less "value" depending upon the amount of energy that has to be expended in their mastication and digestion.

TABLE 1.  
FULL VALUE 100.

Linseed Cake ... ..	97	Grass ... ..	87—91
Decorticated Cotton Cake ...	97	Red Clover ... ..	89—92
Undecorticated Cotton Cake	84	Oat Straw ... ..	43
Coconut Cake ... ..	100	Barley Straw ... ..	46
Sesame Cake ... ..	97	Wheat Straw ... ..	32
Oats... ..	96	Bean Straw ... ..	48
Maize ... ..	100	Pea Straw ... ..	44
Beans ... ..	97	Potatoes ... ..	100
Peas... ..	98	Mangels ... ..	70—74
Dry Grains ... ..	84	Turnips ... ..	78
Meadow Hay ... ..	67—74	Cows' Milk ... ..	100
Clover Hay ... ..	70—74		

In the case of potatoes it should be explained that the high position they occupy, compared with roots, is because in them the carbohydrate (which is the chief nutrient they contain) is starch, whilst in mangels, turnips, swedes, it is mainly sugar. Sugar is not utilised so profitably as starch, for it easily undergoes decomposition under the influence of the bacteria found in the alimentary canal.

It is very convenient when dealing with foods or rations to make use of what is termed their "starch equivalent." By means of this starch equivalent the total feeding value of a food is expressed in terms of a single "full value" nutrient. The nutrient or food constituent which has been selected by one of the chief authorities on the nutrition of animals is starch, for its effect when added to a basal ration has been accurately determined.

The following table shows the starch equivalents of some of the commoner feeding-stuffs, and full lists are to be obtained in books dealing with the feeding of animals:—

	Starch Equivalent lbs.		Starch Equivalent lbs.
Linseed Cake ... ..	76	Meadow Hay ... ..	31
Decorticated Cotton Cake ...	71	Clover Hay ... ..	31
Undecorticated Cotton Cake	40	Grass ... ..	12
Coconut Cake ... ..	78	Green Clover ... ..	10
Soya Bean Cake ... ..	68	Green Lucerne ... ..	10
Wheat ... ..	73	Oat Straw ... ..	19
Barley ... ..	74	Barley Straw ... ..	19
Oats... ..	63	Wheat Straw ... ..	12
Maize ... ..	84	Pea Straw ... ..	15
Beans ... ..	67	Bean Straw ... ..	19
Peas... ..	70	Mangels ... ..	7
Wheat Middlings ... ..	74	Turnips ... ..	6
Wheat Sharps ... ..	58	Swedes ... ..	7
Wheat Bran ... ..	47	Potatoes ... ..	19
Rice Meal ... ..	70	Carrots ... ..	9
Dry Grains ... ..	51	Cows' Milk ... ..	16

As an example of what starch equivalent means, we may take the case of linseed cake which stands in the list at 76. This figure informs us that when 100 lbs. of linseed cake are added to a maintenance diet, the effect in producing body fat is the same as though 75 lbs. of starch had been added. These starch equivalents were determined by the use of fattening animals, but they apply equally well to dairy cattle, provided the requisite amount of protein (albuminoids) is contained in the ration. An extra allowance of starch equivalent and protein must, of course, be allowed for the milk which the animal is producing. This is clearly seen when the feeding standard for an animal kept on a maintenance ration is compared with the one that is held to be correct for a cow giving 20 lbs. of milk daily.

For animals of 1,000 lbs. live weight :—

	Starch Equivalent lbs.	Protein lbs.
Cow on Maintenance Diet ... ..	6.0	0.7
Cow giving 20 lbs. Milk daily ... ..	9.8—11.2	1.6—1.9

These feeding standards, as well as others for different animals, have been determined with great care and by various authorities, and when allowance is made for the difficulties of the work and the individuality of the animals, the information which they give is very helpful. It must of course not be forgotten that the standards are only meant to serve as a starting point, and the effect of the feeding is a matter for the careful observation of the farmer. Rations should be compared with these standards, and if any considerable disparity is found some adjustment should be made. Taking the case of a 1,000 lb. cow giving 20 lbs. of milk daily, we have just seen that starch equivalent of from 9.8 to 11.2 lbs. is required and 1.6 to 1.9 lbs. of digestible protein. In addition to these figures it is recommended that the actual dry matter of the ration, that is the food freed from water, should weigh 25 to 29 lbs. and the fat may be  $\frac{1}{2}$  lb. A cow of less than 1,000 lbs. live weight would naturally require less and a heavier cow more than is laid down in the standards. So, too, when a larger quantity of milk than 20 lbs. is given, extra food must be allowed; and if  $2\frac{1}{2}$  lbs. starch equivalent, and  $\frac{1}{2}$  lb., or slightly more, protein are given for each additional 10 lbs. of milk, the extra amount of fat required by the standards need hardly be considered, for it is almost certain to have found its way into the ration in the added food.

When, on the other hand, the cow is dry, there can be a reduction of the ration, but it would never happen in ordinary practice that the maintenance limit would be reached, for the cow would either be gaining weight by getting fat or would be heavy in calf.

These examples of what is known about the science of feeding are given to illustrate what uses may be made of the knowledge that is available; and as all the experimental work that has been necessary



in connection with the feeding standards, &c., has been done at the expense of much time, trouble, and money, it seems a pity that the results are not utilised to a larger extent in farm practice. In many instances it is conceded that the most economical methods are being employed as the result of careful observation on the part of individuals, but a ration that is decided upon after careful calculation is rare.

The ideal ration for dairy cows is one that imitates as closely as possible the natural food—grass. When the properties of grass are considered, the first place should probably be given to succulence, and it is very difficult to give to any made-up ration this quality to the same degree. Then, too, grass is palatable, and the effect of palatable foods has already been noted. Apart from these two factors, there is the relation between the constituents of the grass which, when it is at its best, is particularly well adapted to milk production. How far the well-known influence of grass on the milk yield is due to small amounts of certain substances which the ordinary methods of analysis fail to detect it is not easy to say, but without doubt it is very difficult to prepare a ration that will compare with good fresh grass as a milk-producing food.

Confining the consideration of the feeding of cows to the winter period when grass is not available and all the food has to be fed by hand, it will be seen that succulence can only be produced by roots in this country. In a few exceptional cases silage is used, and the experience of other countries, particularly by the United States and Canada, shows how valuable this feeding material is.

The mixing of chopped roots with the chaff and meals and the sprinkling of the heap with water or diluted treacle serves to give the ration a better flavour and more succulence, for both of which facts the animal will almost certainly show itself appreciative. As has already been mentioned, as much variety as possible should be introduced into the ration, and with the help of the tables of standards and starch equivalents it is a simple matter to check it when any alteration is made.

As it is the almost general practice to use oil cakes, the properties and method of feeding which it is not necessary to describe, the only word of caution is to avoid extravagance, for these feeding stuffs cost a good deal of money and are not always used as economically as they should be. A mixture of linseed and cotton cakes, the use of moderate quantities of soya bean cake, a trial of the less common coconut, palm nut, or earthnut cakes, if they are selling at relatively low prices, can be recommended, and from time to time an observant man will find that one cake is selling at a relatively cheap rate and is worth purchasing. Whilst it would be manifestly unfair to decry the use of all compound cakes, it should, nevertheless, be realised by all those who study economical feeding that a lot of stuff is put upon the market that is not good value for the money which is paid for it. Although chemical analysis is some assistance in checking the value of feeding-stuffs of this description, it does not in the ordinary way show how much of the material is digestible, and so a cake that analyses well may

still be unsatisfactory. A cake made from one kind of seed only is much more likely to be pure, and the digestibility of the standard cakes has frequently been determined.

From time to time new or uncommon oil cakes are put upon the market, but no considerable quantities are generally available. Thus we have had in recent years such cakes as kapok, poppy seed, sunflower seed, niger, sesame, safflower, para nut, &c., some of which have proved themselves very satisfactory in use and have been sold at relatively low prices.

Gram is now a fairly common feeding-stuff, and has shown itself to be very valuable for dairy cows. Maize germ meal, gluten meal, and gluten feed are also well tried foods suitable for cows.

As the facilities for obtaining advice upon new feeding-stuffs are much greater than used to be the case a farmer has no excuse for remaining ignorant of any fresh material that is put upon the market. In most of the counties there is now an agricultural expert who can be consulted free of charge, and many of the large agricultural societies have an arrangement with an analyst whereby samples of foods can be tested at low rates and an opinion given. Some local authorities have undertaken this kind of work through the agricultural colleges, and in any case it is safe to say that no farmer need experience difficulty in getting full information about a food he proposes to use.

Mention has already been made of the benefits that milk-record societies are likely to have in promoting economical feeding, and in fact most of the information that is available has been collected by these societies, which, in addition to recording and testing the milk, record the food that is being used on each farm that is visited regularly. In England this work has not been carried on sufficiently long to allow of the results being accepted without reservation, but investigations which have been undertaken in Kent, Surrey, Yorkshire, Berkshire, Notts, &c., have furnished much valuable information.

The investigations in Kent and Surrey during the year 1912 have given some very striking figures, and as they are being continued, subsequent years will modify or confirm some of the present findings. It was found during the first three months of the year, when full winter feeding was in progress and when it was easy to estimate the cost of the food required for the production of a given quantity of milk, that figures varying from 5d. to 9d. per gallon were obtained. Of the 20 farms under observation the cost of food per gallon was 5d. in two cases, whilst the maximum of 9d. was only found in one case. The average price worked out at 7d. per gallon, and on seven of the 20 farms the cost was 7d. to 8d., and on four farms 8d. to 9d. These figures, it may be emphasised, represent the cost of food only. The full report of the investigations which can be obtained from the South Eastern Agricultural College, Wye, Kent, is of great interest to dairy farmers, as it analyses the returns and points out how the high cost is brought about, and how it is possible to produce milk in other cases at the average or less than the average expenditure on food.

Another report on this subject has been published by the University of Leeds, and deals with the results of two years' investigations on Yorkshire dairy herds. Here again it is seen that considerable variations occur, for the cost of food per gallon of milk varies from 5d. to within a fraction of 8d.

In Notts a preliminary inquiry conducted by the Midland Agricultural and Dairy College showed that on 12 farms the average cost of food was 7d. per gallon, with a minimum of 5d. and a maximum of 8½d., whilst the cost of the daily ration varied between 1s. 8d. and 1s. 0½d. It is interesting to note that seven of the 12 farms were above the average for the price of the daily ration.

Lack of space prevents a more detailed study of these enquiries into the cost of the food used in the production of milk, but anybody who is anxious to learn what has been done can obtain the bulletins from the educational centres mentioned above.

Any remarks upon the economical feeding of dairy cows would be incomplete if some mention were not made of the greater returns that can in many cases be obtained by the proper care and manuring of the grass land. Field trials that have been carried out in various parts of this country show that both meadows and pastures can be improved by suitable means, and every dairy farmer who wishes to produce milk as profitably as possible should not omit to give this question his close attention. The yield of hay and aftermath from a meadow that has been dressed with a suitable manure will generally go a long way to keep down the cost of food, for the larger quantities are produced at a relatively small expense. A dressing of slag and kainit in the autumn, followed by a little nitrogenous manure in the spring, will often work wonders; and another well-tested mixture, especially on soil containing an adequate amount of lime, is superphosphate, sulphate of potash, and sulphate of ammonium. Lime alone will often increase the crop very considerably, but it must not be used to excess. Another point which deserves attention is the waste of liquid manure, for it seems to be the opinion amongst many excellent farmers that the liquid manure spoils the quality of the hay. This would, of course, be the result if excessive quantities were used, but compared with France, for example, it must be agreed that a very considerable quantity of valuable fertilising material is allowed to run to waste every year.

Pastures should also be carefully manured, for where milk is being produced and sold off the farm either as milk or cheese, there is a continuous and heavy drain upon the fertility of the soil. The well-known Cockle Park experiments have shown beyond all question that the increased return due to proper manuring can be translated into mutton. A similar experiment carried on at the Midland Agricultural and Dairy College since 1909 has proved that the improved quality of a pasture due to manures can be directly measured by the yield of milk. This demonstration, which consisted in dividing an eight-acre field into halves and then accurately weighing the milk produced on each half has proved astonishingly successful, and the average

yearly increase from 1909 to 1912 has been  $93\frac{1}{2}$  gallons per acre, or a total from the four acres of  $1,491\frac{1}{2}$  gallons above that obtained from the unmanured plot. This increased yield was brought about by the use of 4 cwts. of superphosphate and  $1\frac{1}{2}$  cwts. of sulphate of potash, the cost of which works out at 29s. 6d. per acre. In the first year of the experiment this outlay on manure was more than paid for by the extra quantity of milk that was obtained from the plot on which the artificials had been put.

This experiment is deserving of notice in another particular, for it has shown that the improved herbage which has been called forward by the manuring is maintained and persists after the direct influence of the manures must have passed. A summary of the recommendations for the economical feeding of dairy cattle as far as the subject has been dealt with in this article may fitly be :—

- (1) See that each cow is getting enough food to enable her to yield the maximum amount of milk she is capable of producing throughout the period of lactation
- (2) Modify the quantity and quality of the food in accordance with the milk yield, but err on the side of giving too much rather than too little. Let the food be as palatable and succulent as possible.
- (3) Give personal attention to the feeding and recognise that some foods give a smaller net return to the animal than do others which are easier to masticate and digest.
- (4) See if the ration complies fairly closely with the standards suggested.
- (5) Be careful in the purchase and feeding of cakes or other concentrated foods, and make use of the advice and facilities for analysis which are so generally available.
- (6) Weigh the milk of each cow and, if possible, join a milk-record society which undertakes not only the weighing and testing of the milk, but also estimates the cost of food used in the production of the milk.
- (7) Manure meadows and pastures to get the best returns, and to make good the loss of fertility to the soil which is the result of the disposal of milk.

## GOATS, AND THEIR IMPROVEMENT AS MILCH STOCK.

By H. S. HOLMES PEGLER, Hon. Sec. British Goat Society.

THIS subject, upon which I have been invited to contribute an article for these pages, is one which, on reflection, seems well adapted to this Journal on account of the very important part played by the Association, through its Dairy Shows, in bringing the goat to its present state of—I may almost say—perfection.

In order to explain this, and at the same time indicate the strides that have been made in goat breeding during the forty or so years that attention has been given to the subject, I find it necessary to review the early history of the movement and give the events in chronological order that have brought this about.

### THE FIRST DAIRY SHOW.

I may here remark that I have a vivid remembrance of the goats exhibited at the original Dairy Show held on October 24th and three following days in 1876, before the Association was actually called into being. In this connection I may mention—with apologies for the egotism—a circumstance I had forgotten, and of which I am only now reminded by a perusal of the catalogue, viz. : that the first entry on that occasion was in my own name—or at least in the name I wrote and exhibited under in those days, “Stephen Holmes.” The classes in that year were but two in number, the first being “for the best two goats in milk,” and the second “for the best one in milk.” The value of the prizes was out of all proportion to the number of entries, and far in excess of the money offered in these days. Thus the first prize in the class for doubles was £8, and in the other class £5, the lower prizes being on the same scale. The entries, however, were very few, there being only one besides my own in the former, and ten in the latter class. The favourable chance I had of winning the higher of these prizes was lost, as I now recall, through accepting the Committee’s invitation at the last moment to officiate as judge at this show, when my entry had of course to be withdrawn. The only other goat was such an indifferent specimen that a third prize was all that could be awarded to it.

The exhibits in the class for single goats were for the most part a nondescript lot, only a few showing any merit. The first prize, however, was well ahead of the rest, and it may be said to have afterwards “made history.” It belonged to a man of the name of Chapinan, a cab proprietor on a small scale, who certainly had a good idea of goat breeding. The animal was described in the catalogue as a “Brown Pole (? polled) goat, in milk ; has had eleven young ones in three years,

two fours and one three; price £10." At that date nearly every she-goat was called "Nan" or "Nanny," just as every male was "Bill" or "Billy," but this particular animal did not acquire a name at all until it won its £5 prize, and then it was christened "Kit." Now "Kit" was mated that year to a rather popular hornless stud goat well known to frequenters of the Liverpool Road, Islington, as "Harley Payne's Bill." The pair produced a she-goat, "Kate," in 1877, and in the following year she bred another history-making specimen in "Champion," the sire of many a subsequent prize winner. These two goats figure as Nos. 3 and 4 in the Herd Book. Among the exhibitors of goats at this early date was, I find, "James Blyth, of Stansted, Essex," who afterwards became Sir James, and is now Lord Blyth; but though his goat got commended, his name does not appear again in the goat classes at the Dairy Show, though often met with in other classes. At this first show those who had the management of it had had no experience with goats, for I find a note in my report at the time that after the first day no official could tell who the goats belonged to nor what prizes they had won, for the number and prize cards were placed at such a height that in a few hours the goats had eaten them all off and had even demolished each other's labels.

#### THE SECOND DAIRY SHOW.

The second Dairy Show, held on October 3rd to 8th, 1877, brought goats very prominently to the front, for in consequence of an outbreak of cattle plague at that period the cattle classes had to be cancelled by an Order in Council, and our humble friends accordingly were the sole representatives of milch stock, the cattle stalls being filled by mules and donkeys of all kinds and sizes. The goat classes were extended to three, with an extra class for "Cottagers' Goats," the prizes in the latter, to the value of £10, having been offered by the Baroness Burdett-Coutts, who had just begun to interest herself publicly in these animals. All exhibits here had to be shown "in milk or springing for kidding." The classes were arranged for "British short-haired," "British long-haired" and "Foreign—pure, or crossed with British breeds." After the cattle classes had been withdrawn two extra goat classes were added, one for kids under 8 months old, and the other for he-goats (geldings). This show was a marked improvement over its predecessor, both in quality and in number of exhibits. It was well advertised amongst the goat-keeping community and resulted in no less than 118 entries. The foreign class contained specimens described as Indian, Cashmere, Angora, Abyssinian, Norwegian, and Maltese, and genuine specimens of many of these varieties were actually on view, for it was before the Board of Agriculture, with its restrictions against importation, had come into existence. In connection with this show a somewhat amusing incident may be related. The Duke of Wellington of that day—son of the "Iron Duke,"—was an exhibitor of mules and goats, and whilst inspecting the goats he took a fancy to an Angora that was marked for sale. He made his way to the sale office with the object of purchasing the animal, and after some preliminaries was asked his name.

It unfortunately happened that the person who had been just making a purchase was a "licensed victualler" who had given his address as "The Marquis of Granby"; so when the other historic title previously mentioned was given, the clerk, thinking he had before him another "wine and spirit merchant," observed somewhat brusquely: "Never mind your address, let's have your name." His Grace looked puzzled and did not reply, but another clerk who was present, and who had been in the army under the second Duke, recognised the speaker as his Grace, and hastily gave his colleague to understand that the applicant was no other than the Duke himself.

#### THE DAIRY SHOW OF 1878.

This Dairy Show was the first held under the management of the British Dairy Farmers' Association, and being at the time the Honorary Secretary of the Association, I had the secretarial work of that show on my hands, and something more, for it was not then in the highly organised state it now is, with its stewards and assistant stewards, all more or less experienced, and many supplementary duties devolved on the secretary. The goat classes at this show were again extended, and this time divided into "Short-haired, with horns," "Long-haired, with horns," "Hornless," "Kids, male," and "Kids, female," under twelve months. The prizes were, as in the previous year, £4, £2, and £1, except in the class first mentioned, when the second prize was £3, and a fourth was added at £1. An extra prize was offered, value £5, "for the goat yielding the largest quantity of milk without reference to the time of kidding, no award to be made for a less yield than two pints at one milking, and at least twelve hours to elapse between the two milkings." An extra fee of 1s. was charged for goats competing for this prize. My old friend, Mr. W. K. Taunton, was an exhibitor at this show, winning V.H.C., and our acquaintance was made, I believe, on that occasion. Another well-known name at the present day among members of the B.G.S. was Mr. Herbert E. Musgrave, of Bolton, who also exhibited then. Dr. Crisp, of Walworth, one of the pioneers of the goat movement in the early seventies, was a very successful exhibitor at this period, and carried off the £5 milking prize with a goat which was described in the report published in the *Bazaar* as having given 3½ pints in rather more than half a day.

#### THE BRITISH GOAT SOCIETY.

The year 1879 is a memorable one for goat-keepers, for in October the British Goat Society was instituted, a circumstance with which the British Dairy Farmers' Association was again connected, as for some years the junior institution was affiliated to it. Moreover, the inaugural meeting took place at the Dairy Show, as, indeed, the annual meetings have done ever since.

With the advent of the British Goat Society and the Baroness Burdett-Coutts' patronage and influence, the improvement in goat breeding proceeded at a more rapid pace. The Royal Agricultural Society introduced goat classes at its never-to-be-forgotten Kilburn Show

in June, where the constant rain turned the Show ground into a quagmire.

The Baroness herself began showing goats here for the first time, and won premier honours. From that day forward until the death of that benevolent lady, no show of goats of any importance took place without some of her stock being exhibited, and rarely, if ever, was a catalogue printed which did not contain her honoured name in the prize list. Until this period the goat had been far more "the poor man's cow" than it can be said to have been in later years. No movement towards the improvement of stock can be successfully carried on without the expenditure of capital, and Lady Burdett-Coutts spent many a ten-pound note—which in those days was considered almost a prohibitive price—for these animals in laying the foundation of her afterwards famous herd. The first success achieved by a goat bred at Holly Lodge was at the Alexandra Palace Show, in 1880, when Polly, a goat of Anglo-Nubian type, won a third prize. My esteemed colleague, Mr. B. Ravenscroft, made his *debut* as an exhibitor of goats on the same occasion, winning a similar prize in another class, and although the Bricket herd did not turn out conspicuous milkers like those which brought fame to the Holly Lodge collection, it produced during the thirty odd years of its existence a long list of winners and established a strain which has been much sought after among Anglo-Nubian breeders, so that the Bricket blood can be closely traced in all the best specimens of the present day.

Another name which figured somewhat prominently in goat show catalogues about this period was that of Professor Smonds, Principal of the Royal Veterinary College, and he was followed for a short time by his subordinate, Professor J. Wortley Axe, who subsequently did good work professionally for the cause of the goat. The former of these veterinary authorities, however, had a "bee in his bonnet" as regards the goat fancy, in his abhorrence of hornless stock, and he went so far in carrying out his fad as to get a regulation passed by the Council of the R.A.S.E. at the Kilburn Show that any goat without horns would be disqualified. As "polled" stock were then, as now, most sought after, this regulation was protested against by the goat exhibitors as a body, and I believe was afterwards cancelled.

From the beginning of the eighties, classes for goats became more general at Agricultural Shows. A Dairy Show was started at Birmingham which was intended as a replica of the London Show, to be continued annually—but failed. Here goats figured as at Islington. Altrincham, in Cheshire, followed in 1882, being for many years after supplemented by similar competitions at Hatfield, Halifax, and Great Ayton.

#### INTRODUCTION OF FOREIGN STOCK.

Up to 1883 nearly all prize-winning goats were of the lop or broken eared variety, since known as "Anglo-Nubian," though at that period the term was somewhat of a misnomer, as no pure "Nubian" goat had so far been brought into the country. With the advent of the year



mentioned, however, importation of foreign stock in a small way began. The pioneer in this movement was Mr. Paul Thomas, of New Malden, Surrey, who was one of the first, not only to import, but to make quite an income out of goat breeding, and not a little goat dealing. This breeder, a Belgian by nationality, brought a pair of quasi-Nubians from the Jardin d'Acclimatation in Paris in 1863, and in 1884 some Toggenburg goats from Switzerland. Very little good was done in the way of improving the goat as a milker with the former of these, but with the introduction of the Toggenburg a distinct advantage was gained in this way, for this variety came from a Canton where goats had been specially reared for utility purposes, not merely for generations but probably for centuries. Great pains are taken in Switzerland to maintain a high standard of milk production in the various breeds, and also to breed stock true to type and colour, and, in the case of Toggenburgs and Saënens, to eliminate horns. With the specimens of the former that at this time were imported, an incentive was afforded therefore to British breeders, not only to improve the yield of the common goats, but also to establish in this country a race that could be kept pure and bred true to type. So Toggenburgs rapidly became extremely popular, and in great demand. A further consignment of some half-dozen or so was made a few years later, but after that restrictions arose against the importation of goats on account of outbreaks of Foot and Mouth disease in cattle abroad. The Caprine species is said to be subject to attack, and cases are reported to have occurred in Switzerland, but I have never known one in England.

#### OTHER EXHIBITORS OF EARLY DAYS.

Meanwhile the Dairy Shows continued to be the chief centre for exhibits of goats. The classes included at this period one for "Goatlings," a term corresponding to that of "heifer" in cattle, the word being promulgated by the B.G.S., though Mr. Ravenscroft has the credit of having coined it. Some names well known to British dairy farmers figured successfully in the catalogues during the eighties, amongst them being those of Mr. G. F. Roumieu, a past president, and John Welford and Sons. A very successful breeder appeared about this time in Mr. Charles Rothwell-Jackson, of Bolton, who, commencing the hobby in the first instance, like many others, for the supply of milk to his children, became afterwards an enthusiastic breeder and exhibitor. Probably no goat fancier has done more in support of shows, especially in the Midland counties, and in improving the goats of his day, than did Mr. Rothwell-Jackson. He gave up his herd in 1897, selling the whole to Sir Humphrey de Trafford, for, I believe, £250, shortly before the Show of the Royal in that year at Trafford Park, Manchester.

#### THE HERD BOOK.

In 1886 a further stimulus was offered to goat breeding through the publication of the British Goat Society's Herd Book, the first part being issued in that year. Although such a work was contemplated

when that Society was first instituted in 1879, it was some years before effect could be given to the idea. The question as to how to start a record of this kind with no recognised standard for breeds, and no consideration for purity of blood, was somewhat of a puzzle. I should perhaps explain, therefore, how this Herd Book came to be instituted, and what conditions governed entry therein. As I have just observed, the propagation of goats had not been conducted with any regard to purity of breed, as most of the goats in England in those early days were just the common kind. Secondly, very few pedigrees had been recorded, so there was practically nothing to start with. The only foundation, therefore, upon which it seemed possible to build a record of any value was the prize list. The mere fact of a goat having won a prize, however, even though its parentage might be known, was not considered sufficient justification for allowing it to be entered in the Herd Book. It was necessary that the animal should possess in addition to its good appearance and superior milking properties—for milk was from the first the essential feature aimed at—the capability of transmitting these qualities, in order that any one procuring and using Herd Book stock might have some reasonable expectation of improving his own strain thereby. A mere pedigree alone without any such qualification attaching to it would be valueless. Accordingly, if a goat won a prize, and bred a kid which also won a prize, that kid at once became eligible for entry. This was, of course, the elementary stage. Subsequently other conditions were introduced into the general Herd Book, and at the present day sections of that volume, in addition to the general section, are devoted to certain breeds, such as Nubians, Anglo-Nubians and Toggenburgs. In later years a milking section was added to the Herd Book, which has had an important bearing on encouraging milk production. I refer to what are known as “Star” goats. In order to identify in a pedigree those animals which have won milking prizes an asterisk is affixed to their names, and in cases where such a goat owns a dam that has gained a similar honour the former is entitled to a double star, and so on as subsequent descendants figure successfully in milking competitions. The number of stars in a pedigree thus show at a glance the prize milkers in the family. Similarly male goats are distinguished by the mark of the dagger (†), as a prefix to their name, where such a goat is the produce of a dam that has won a milking prize by a sire which is also bred from a milking prize winner. These males are known as “Dagger Billies,” and their services are in great demand by breeders who are anxious to improve their herd for milk production.

#### MILKING COMPETITIONS.

The milking trials at the Dairy Shows have doubtless largely contributed to the present improvement of the goat as a milker. The first of these was added to the Schedule as long ago as in 1894. On that occasion there were nine entries, the first prize winner being Mr. Grunell's “Patti” (H.B. 262), an Anglo-Nubian of the old type, by the Baroness's “Garnet,” ex “May Blossom,” which was by “Spot” (H.B. 19), another

Holly Lodge goat, whose dam was "Polly" (H.B. 1). The total yield, ten days after kidding, for one day was 6·8 lbs., rather more than five pints. So the first milking prize winner of this first Milking Class was a descendant of the first Herd Book she-goat, thus showing the Herd Book to have been established on sound practical lines. This competition was further remarkable through having produced a goat which gave the richest milk in butter fat of any that has ever been tested. Indeed, the analyst declared it to contain the greatest percentage of this constituent of the milk of any animal he had ever examined. This goat was Mr. R. J. Pitt's "Jessica," an Anglo-Toggenburg. The analysis showed 22·56 per cent. of solids, of which 12·19 was butter fat. This was at the Show, but subsequently the owner had a full analysis made, and the report given was: Water, 83·21; fat 7·30; casein, 4·18; sugar, 4·10; ash, 1·21. The specific gravity was 10·31.

At this period, and indeed until 1907, two points were deducted each time that the percentage of butter-fat fell below four, so that a goat showing a large yield was heavily handicapped if it should happen to be a poor milker for quality, losing four points out of say a total of 18. This being represented to the Show Committee as out of proportion to the deduction in the case of cows, the figure was reduced to one point on each occasion.

Coming now to 1904, we find the number of entries about the same as at first. In that year, Mr. Ravenscroft won the First Milking Prize and the Baroness Burdett Coutts Challenge Cup with "Sedgemere Louise," a Herd Book Anglo-Nubian, a circumstance which did not occur again until quite recently.

#### SOME REMARKABLE MILKERS.

In the following year an imported goat figured on the scene at the Dairy Show, one out of a consignment from Paris about the close of 1903. This was Mr. Sam Woodiwiss's "Sedgemere Faith," an animal which decidedly made history in the annals of goat shows, and has many descendants among the successful exhibits of recent years. Until this goat appeared the writer could never admit having met a gallon milker, but "Sedgemere Faith" not only reached that quantity, but considerably exceeded it.

The following table shows the yield of this goat during five consecutive days, the milk being carefully weighed under my own observation. In the last 24 hours of this test the supply was 10 lbs. 10½ oz., or exactly a gallon and half a pint. It is important to state that the animal was not at the time in her full flush, having been in profit already five months, and it was then the month of September, when most goats are going dry.

							lbs.	ozs.
Sept. 1 (p.m.)	...	...	...	...	...	...	5	2
" 2 (a.m.)	...	...	...	...	...	...	5	3
" 2 (p.m.)	...	...	...	...	...	...	5	3
" 3 (a.m.)	...	...	...	...	...	...	5	0
" 3 (p.m.)	...	...	...	...	...	...	4	12

						lbs	ozs.
Sept. 4 (a.m.)	...	...	...	...	...	5	3
„ 4 (p.m.)	...	...	...	...	...	5	3
„ 5 (a.m.)	...	...	...	...	...	5	7½

This shows a daily average of 10 lbs. 5 ozs.

Returning to the Dairy Show milking trials, however, in 1907 “Sedgemere Faith” won second prize, giving a daily average of 7·35 lbs., and making a total of 16·9, after two points had been deducted. She had then been in milk since April 2nd. The first prize winner was “Sedgemere Capella,” a Toggenburg, belonging to Mrs. Handley Spicer. This goat kidded about the same date, but her average yield was still larger, being 8·55 lbs., just about 7 pints. The total points gained were 19·75, but two points deducted reduced it to 17·75. These figures show the improvement gained in that year (1907) in milk production since this competition was started, the points here given being the highest obtained up to that time.

In 1911 another remarkable goat appeared on the scene, winning first Milking and the Baroness Challenge Cup. This was Mrs. Straker’s Leazes Eve. She kidded on April 3rd of that year, and her quantity for one day was 7·30 lb. and her total points 19·50, but being mulcted of one was thereby reduced. This animal kidded again the following April, and during the three weeks ending May 18th, 1912, she gave a daily average of 11 lbs. 4 ozs., 12 lbs. 3 ozs., and 11 lbs. 4 ozs. respectively, the yield in the middle week here being practically an average of five quarts a day, as much as is given by many Kerry cows at the same stage of lactation. As a matter of fact this goat has given during the first fifteen weeks after one kidding close upon *half a ton of milk*!

Bringing now these Dairy Show milking competitions up to date, I find that in 1912 Miss Mortimer’s Cowslip III, the first prize winner, gained a still higher total, the points reaching 19·77, being made up thus : Milk points, 7·55 ; time, 2·10 ; fat, 7·44 ; and other solids 7·68, thus showing the highest quality as well as the largest yield on that occasion, a very unusual combination. The entries were 16 in number. The pinnacle, however, both as regards entries and the points obtained for milk, was reached in 1913, when the competitions brought together no less than 26 goats. The first prize winner was Miss Mortimer’s “Wigmore Cornflower,” whose total points amounted to 21·06 without any deductions, made up as follow :—Time, 2 4 ; weight of milk, 7·7 ; fat, 8 2 ; other solids, 2·76. “Cowslip III” came in a good second this year with 19 96, gaining thus 22 more points than she did in 1912. Both these goats kidded at the end of May, so their daily yields of 7·7 lbs. and 6·95 lbs. respectively were exceedingly good. In both these goats the milk showed a high percentage of butter fat, which, as I have remarked above, is uncommon when associated with a large quantity. The analysis gave 5·17 and 5 39 for “Cornflower,” and 5·51 and 5·46 for “Cowslip,” the two sets of figures in each case being for the morning and evening milkings respectively.

## BARONESS BURDETT-COUTTS' CHALLENGE CUP.

The milking classes are open to goats of any and every breed, and the prizes have no reference to points of inspection. The Baroness Burdett-Coutts, however, offered, many years ago, a challenge cup to be competed for annually for the goat winning highest points by inspection and milking combined. This competition is carried out in the following manner:—The best three goats in the inspection classes, if entered, or such of them as are entered also in the milking class, are rejudged together and receive points in accordance with their respective positions. The exhibit placed last receives one point, that placed next two points, and so on to the goat placed first, which receives as many points as there are competitors. The points thus gained are added to the actual points acquired in the milking competition, with the addition of three points to the first prize winner in that competition, two points to the second, and one point to the third prize winner. These additional points are awarded so that the practical qualities of the goat may fairly correspond with the high number of points gained under inspection when a large number of competitors are present. The winner of this coveted award in 1913 was "Wigmore Cornflower," previously alluded to. This grand goat, though showing most of the points of the pure Toggenburg, is technically an "Anglo-Swiss," and is the daughter of "Cowslip III," the second prize taker mentioned above. We have thus here a good illustration of a grand milking goat transmitting her qualities to her daughter, who even eclipses her. This goat had been milking exceedingly well all through the summer, having given in three milkings at Braintree at the beginning of June 15 lbs. 6½ ozs.; at Tunbridge Wells in July, 16 lbs. 14 ozs.; and at Hastings in August, 17 lbs. 2 ozs., thus gradually increasing her yield as the months went by instead of diminishing it, as is almost invariably the case.

## PRICES OF PRIZE GOATS.

The facts and figures here given show conclusively the advance made in improving the goat as a milker, whilst the prices realised for specimens, such as those mentioned have risen in like proportion. Whereas, as I have shown, £10 was regarded as a prohibitive figure thirty years ago, that sum is now commonly given for quite ordinary animals, whilst £15, £20, and even £40 are not infrequently paid for such stock as those just referred to. Indeed, when once a name is acquired as a successful exhibitor of "Star" milkers, goat breeding should be a profitable pursuit. Amongst those who may be mentioned in this category during recent years are Lady Dunleath in Ireland, and Lady Acland, Mr. Sam Woodiwiss, Mrs. Straker, Mrs. Handley Spicer, and Miss Mortimer.

## THE PRODUCTION OF CLEAN MILK.

By ROBERT MOND, M.A., F.R.S.E.,

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THE great mortality among infants and the extremely unhealthy condition of a very large proportion of the survivors led us to conclude that the problems of infantile nutrition and malnutrition demanded extended scientific investigations.

In order to insure a sufficiently wide and unbiassed review of the facts, it was essential to bring into correlation various factors. By the establishment of The Infants Hospital, the Farm supplying the Hospital, and the Research Laboratory at the Hospital, we have been enabled to carry out systematic investigations upon the alimentary diseases of infants, the various questions connected with milk and milk production, and the part played by the precise condition of the food administered to infants in the production of disorder and disease. We propose in the present paper briefly to summarise such of our observations as may be of interest to the dairy farmer.

A small proportion of infants are born in such a condition that it is unlikely they can develop into healthy children even in the most favourable circumstances. These are the victims of congenital defect or disease. A very large proportion of these defectives die in the early weeks following birth.

The great majority of the infants (about 90 per cent.) born in this country are born healthy. This has been established beyond all reasonable doubt by the evidence of the experts given before the Inter-departmental Committee on Physical Deterioration in 1904.

The reason for the mortality and disease among infants is the *altogether inadequate food* that a very large proportion receives. That the deaths and disease cannot be due, in any considerable measure, to housing conditions is demonstrated by the breast-fed babies who thrive where the artificially-fed babies die. The systematic encouragement of the mothers to nurse their infants and the rendering of such assistance and advice as will enable the mothers to provide milk sufficient in quality and quantity are therefore factors of the greatest importance.

In all civilised countries, however, the breakdown of maternal nursing is widespread and the need of an efficient substitute for human milk is becoming more and more urgent. That death and disease are

rampant among the young children is not a matter for surprise ; for they are being fed, generally speaking, on an exceedingly unwholesome diet : they are receiving cooked food instead of raw milk.

As knowledge of the essential factors underlying the problems of infancy increases, both among the medical profession and among the laity, the demand for fresh milk is bound steadily to increase. No doubt "sterilised milk" will not be abolished in a day. There may be some who may yet be attracted by the strange devices of "milk cleaning" machinery, pasteurising plants and the like. But the sensible farmer and milk vendor will put on one side all such fantastic eccentricities and will concentrate their attention on the production and delivery of milk, clean and in its natural condition.

There is no doubt, however, that the conditions under which milk is produced and sold in this country leave much to be desired. It is urgently necessary that those engaged in milk production should actively concern themselves with the measures necessary to ensure the cleanliness and keeping qualities of the milk. Contamination from dust and manure must be efficiently guarded against. All the vessels used in milking and storing the milk must be thoroughly cleaned first by washing and then by steam sterilisation. Our observations, which have now been carried on for some years, have demonstrated the urgent need for refrigeration of milk to a temperature not exceeding 40° F. at the time of milking or very shortly after milking. In the summer a large amount of the milk *as obtained from the milk shop* is so far advanced in lactic decomposition that it is unfit for consumption. Milk is the most perishable article of food ; and it is idle to ignore essential precautions which have been found to be necessary by others, such as fishmongers and butchers. If the refrigeration cannot be done at each farm, then in each district the farmers should co-operate so that their milk may be dealt with by refrigerating machinery at the local dépôt prior to its despatch by train. Where milk is distributed to the consumer in the immediate neighbourhood of the farm, and is thus disposed of soon after production, refrigeration may not be necessary ; but it should be applied to all milk despatched from the country to the towns.

To the argument of "cost" we reply that it is much better that 1½ pints of fresh milk should be supplied for a given sum instead of one quart of stale milk for the same price.

The extensive investigations carried out in the Research Laboratory have shown how hopeless it is to endeavour to render milk safe by any process of "sterilising," "boiling" or "pasteurising," and we have satisfied ourselves that the risk of children contracting tuberculosis from the ordinary mixed milk supply is so slight as to afford no justification for the "sterilising" processes that have been so vigorously advocated in recent years. In this country it has proved to be impossible to establish any relationship between the consumption of raw milk and the incidence of tuberculosis, especially in its more serious forms. On the other hand children who have been systematically fed on boiled milk or dried foods appear to be especially liable to be attacked by tuberculosis.

The tubercle bacillus is an ubiquitous organism : it is inhaled frequently by everybody. Nearly every child by the age of 15 years has contracted the tubercular infection without, in the great majority of cases, having manifested any sign of tuberculosis, other than the reaction to tuberculin. The important factor is not the tubercle bacillus but the condition of the child and its powers of defence against bacillary invasion. There is nothing which so disposes a child to contract tuberculosis as the conditions of malnutrition and alimentary disease arising from inadequate and improper feeding.

We are strongly of opinion that all cows suffering from tuberculosis or other disease of the udder should be strictly excluded from a milk-producing herd. In regard to the tuberculin test our observations have shown very clearly that the reaction of a cow to this test affords no reason for excluding her as a milk producer.

Experiments have been conducted for the past two years at Combe Bank Farm with the object of determining whether cows reacting to the tuberculin test can be cured by repeated and increasing doses of tuberculin. So far the results appear to indicate that in a considerable number of cases a definite freedom from reaction coupled with thoroughly good health can be obtained. The question as to whether cows who are really suffering from tuberculosis can be cured by this method is still under investigation.



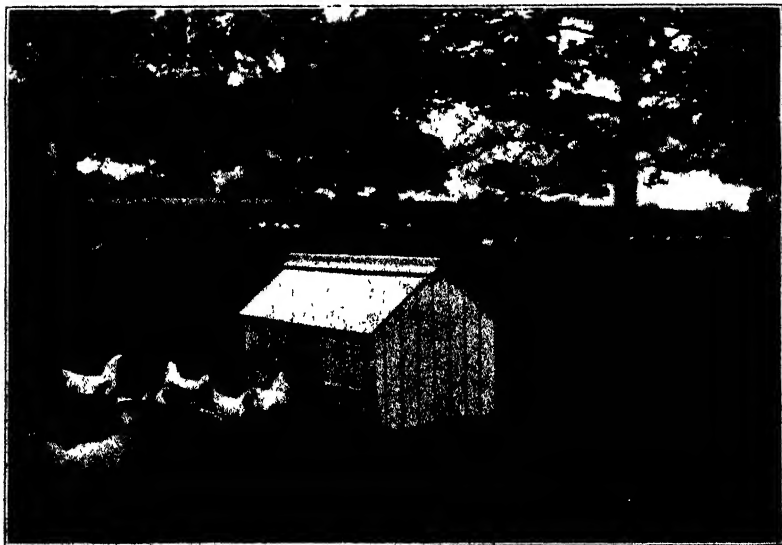
# THE MANAGEMENT OF EARLY SPRING CHICKENS.

## THE BEST BREEDS TO USE.

### HOW TO MATE THEM, &c., &c.

By S. C. SHARPE, Poultry Instructor at the Agricultural and Horticultural College, Uckfield, Hon. Secretary to the Sussex Poultry Club, &c., &c.

Again I am asked to write a short article on "utility poultry keeping" for this useful journal, and, as in former years, my aim will be to make the notes of a practical nature, and of use to poultry keepers and farmers who make a "side line" of poultry. I am pleased to state that many farmers with whom I come into touch make poultry keeping far more than a "side line," they are beginning to see that there is money in poultry.



A Batch of "Sussex Chickens."

[Photo by S. C. Sharpe.]

When we come to think that every year over £20,000,000 worth of poultry and eggs is consumed in this country and not more than half of this is produced in England, it goes to show that it is quite time the British farmer awoke to the fact that poultry should have a little of his attention and time; and when worked on good lines, and given a little thought and care, with land suitable, I am sure that every farmer in the country will say, after a few years' trial, that poultry pays as well as any other part of the farm. It will repay me for the trouble taken in writing this article if I can give a few hints which will be of a really useful nature to those who try to carry them out and put them into practice.

### HOW TO MATE STOCK.

I will first deal with this important subject, and very important it is—as every man may know who has the breeding of stock of any kind, and it is one of the points more often neglected to a great extent by the farmer. He too often thinks that anything with “feathers” will do to breed chickens, and here is the cause of much trouble which often ensues. To mate stock which are not in fit condition, or are unsuitable for the purpose for which they are required, is a great mistake, and one which cannot be put right in a season. If we intend to breed chickens which are to grow fast and be ready for the markets in a few weeks, we must see that the stock is of the right and proper sort; we cannot expect good plants from poor seed, neither ought we to expect good chickens from poor stock.

The breeds of poultry have improved so much during the last few years that it should not be a difficult matter to get something which will give good results, but we must always have in mind the class of trade we are catering for; perhaps it may be in a district where large fowls would not sell well, the price being too high. If this is so, then we must go for a breed which will breed small, quick-growing chickens, and which we can get ready for killing at an early age. But on the other hand, if we can get a market for large fowls, such as are bred in the county of Sussex, and which are still called on the London markets, the “Surrey fowl” or the “Surrey capon,” then that is the bird to make the most profit.

I might say here, that it is practically useless to mate Leghorns, Minorcas, or any of those useful non-sitting breeds (for they are most useful and good for egg production), with some heavy breed, thinking that the cross will produce good layers and good table chickens, for they will not; the pullets may turn out as good layers, but the cockerels will be of no market value for table. It is here where the farmer and small-holder so often go wrong when starting to keep poultry, so I will try to deal with this part of the subject pretty fully, for it is one of the chief points of many failures in poultry keeping.

Let us take into consideration the soil and general aspect of our farm, also the time that we can give to our poultry. It is of no use trying to rear two thousand chickens early in the spring if we have very little time at disposal to manage or look after the birds when they are

hatched, for it must clearly be understood that to hatch and rear the early spring chick means time and patience; and the man or woman who has the care of the birds must be prepared to give a good many hours to the work; and again it is constant work, and cannot be put off for a day or two, so that it is a tie which may not suit everyone, yet at the same time it is most interesting work, and lends itself to the busy person, one who does not want time to hang on his hands.

I have been working in the county of Sussex for a good number of years, and have come into touch with nearly all the best and largest chicken growers, and I am convinced that the rearing of early spring chickens pays by far the best of any branch of poultry keeping, and that is the reason I have chosen this subject for our "Journal," because it should appeal to farmers, and perhaps be the means of some taking a little more interest in this section of the work.

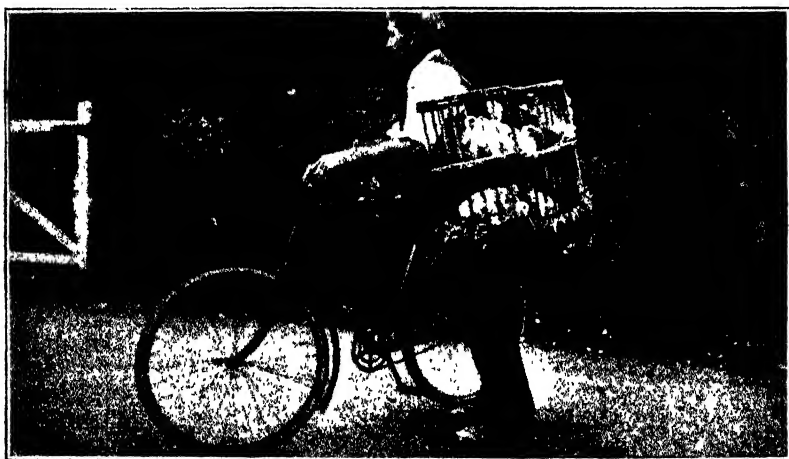
I will now deal with the mating and age of the stock. We sometimes hear people say that it is wrong to sit a hatch of pullets' eggs; so it may be if the pullets are late-hatched birds, but a bird is a pullet until she is twelve months old, and if she has been hatched in the previous January she should be fit for mating in the autumn. There is a big difference in mating such a bird and in mating one which probably was only an egg in April or May. Now I am open to state, after many practical tests made, that the young hen, or pullet as she is called, at ten months old, is the very best possible bird to breed from, and I can prove this at any time, providing she is mated with an early-hatched cockerel or a two-year-old cock. I prefer the cockerel if he is a January-hatched bird. There is by far greater stamina in the chickens hatched from such stock. And then, again, we are able to get early eggs, and without early eggs we cannot expect to get the spring chickens. We always find in practice that chickens which are hatched in the first months of the year, and brought along well, are the fastest-growing birds which we bring up, and any of the best of these which are kept for the next year's stock will be well-grown, fine-looking birds the following autumn; and these are the birds for breeding the next season's chickens. Two or three year old birds may be all very well for some purposes, but we cannot get the eggs from them when we want them, therefore it is useless to think or to expect to breed chickens for the best prices if we only have old stock to rely on.

#### THE BEST BREEDS TO USE.

There are several to choose from, but some are far more suitable than others. Much depends upon the class of market upon which they are to be placed when ready.

We have a breed excellent for this purpose and not yet so well known out of Sussex, called the Brown Sussex. They are huge birds and of excellent colour, being just the class of fowl for breeding early spring chickens. They are hardy, and the pullets lay at an early age. The cockerels can be used for mating with several other breeds, and by doing so it often improves the size and stamina of the progeny. If mated with hens or pullets of their own strain they throw chickens of

quick growth and fine hardy birds, which can often be put on the market at 11 or 12 weeks old. This is another point which I am anxious to make quite clear with reference to rearing spring chickens : if we want to make this part of poultry keeping profitable, we must endeavour to get our chickens off hand at the earliest possible moment, just as the Buckinghamshire " Duckers " do with their Aylesbury ducklings, and with the right kind of fowl it is quite possible to turn them out at the time I have mentioned, providing the feeding and general management is correct ; that part of the work I will deal with later. Another good cross for rearing chickens is the Sussex Faverolle. I like to use Sussex pullets with Faverolle cockerels or cocks ; and if the birds on both sides are of good, heavy stamp the chickens will be useful and quick growers. It is very important that in mating for chicken breeding both pullets and cockerels should be of the largest possible



[Photo by S. C. Sharpe.  
A Higgler collecting Chickens with "back crate" on a cycle

type, but this is too often overlooked by the farmer. All small, badly-grown pullets or hens should be weeded out, for they will only produce chickens which will cost more to produce than they will realise on the markets ; besides, they spoil the appearance of a batch. I should like to point out here that in mating, or in buying birds for mating, see that they are long in the back. A fowl with a long back means a fowl with a correspondingly long breast, and this is what we must aim for in breeding chickens for market. It was the length of back which made the old Dorking such a useful breed for table, and every bird or breed with a long back will throw good useful chickens. We hear a great deal about Game crosses, and for certain purposes they are splendid ; but when it comes to breeding chickens for fattening, the Game cross is not a suitable fowl. Why is this so ? Because it takes

too long to get them to maturity; they are too slow of growth for this purpose, and we must not introduce game if we intend breeding early chickens for the market. I recently mated an Indian Game with some Sussex and some White Orpingtons, and bred several chickens from the pen, but these chickens were three and four weeks longer in growing ready for the fattening pen, and when they were put up did not get the size or the weight that was obtained in less time from the Sussex pure. The meat is good and of good flavour and colour, but it takes too long to produce, which is not right for our purpose.

I would like to mention another matter with reference to the mating of fowls for breeding chickens, and that is, we must be quite certain upon the general healthiness of the stock. If we mate a flock together and one or two of the hens or the cockerel is not in a fit condition, then we may expect trouble when the breeding commences; and how often it happens that this important point is overlooked; a



*Photo by S. C. Sharpe.]*

*[Taken at Warbleton, Sussex.*



**A Group of Chicken Fattens. "Killing Day."**

bird having a white comb and looking anæmic may have developed the liver disease, and to breed from such a bird is a great mistake—it may mean much heavy loss amongst the youngsters, and if not losses, it will mean slow growth. The stock should be healthy and fit, being in a good laying condition, not too fat, or some of the eggs will be shellless and so cause egg eating, a habit which we must always be on the watch for, and which must be stopped at once if noticed.

It is well to go into the poultry house occasionally at night and handle the birds; by doing so the condition of them can be ascertained;

they may be found to be too heavy, or too light if not fed sufficiently ; but I generally find we err on the side of overfeeding rather than under, and one is as bad as the other. A cockerel which has a bumble foot, or is in any other way deformed about the feet, or lame, is not a proper bird to mate; yet, I am sorry to say, we often find such a bird mated at the farm, and the result makes itself known when the first batch of eggs is put down, by most or all of them being unfertile.

#### WHEN AND HOW TO WEED OUT.

I have mentioned that it is better to breed from young stock than to have birds which are old, but it happens sometimes that we have a few extra good winter layers among the flock, or that a few are very good sitters and make good mothers ; then such hens should be kept for two or three years, because a good sitter or good brooder is a valuable asset in the poultry yard. Young hens are not always to be relied upon; such birds are very useful in the early months of the year. I might say here that it is right and possible to use pullets for sitting purposes when they become broody : it is right, because it gives them a rest from egg production, and so builds them up for future work, and they are generally to be relied upon if of the right strain. Generally speaking, it is well to weed out some of the fowls every year. Old hens are costly and of very little commercial value; they require as much attention and as much to eat as younger birds, and yet do not lay until the warm weather comes on, whereas the young hen will lay in the winter, and therefore allow us to get early chickens. A hen over two years, unless having some of the good qualities mentioned above, should be sold or cleared out of the yard. A cock at two years is generally finished ; he may be kept for the third season if of good type and strain, but usually the second year will be the most profitable to get him out of the pen.

#### DISPOSING OF OLD BIRDS.

I think it may be of use to some farmers if I mention how best to clear old hens and cocks and make a good price of them. The best time to sell is just before they come into the moult, say, July or August ; we will then get all the summer eggs from them, and have finished our breeding season, and if they are sold just before the moult we do not lose anything by their getting into a low condition, they will not then require any special fattening and should be quite in a fit condition to fetch as good a price as fat hens. The London salesmen are pleased to have them if sent alive, and will forward crates to pack them in and advise as to the best day of the week for dispatch. The prices obtained for old hens does not vary much if they are healthy, large birds in good condition ; and we may expect anything from 1s. 9d. to 2s. 6d. each for fair birds, age making no difference, even if they are four years old ; but as I have said before, we must not keep the majority so long as four years.

**THE BEST TIME TO COMMENCE HATCHING.**

If we intend to hatch and rear a number of spring chickens, the one thing to remember is early hatching, we must make an early start; and although to some who have never brought up early broods of chickens it may seem at first a difficult operation, yet generally in this country we find we get the best results from our early broods. There are several reasons for this; one is, that the land is less foul, the frost and cold will keep the ground fresh much longer than in the spring and summer, when it gets sour very quickly, therefore we may run the chicks more thickly on the land in the early months and still have good results.

The best time to make a start is as soon as we get a number of eggs in October or quite the beginning of November. If we commence then it will give a chance to get a good batch out before Christmas, and these birds will realise a good market price when ready. After making a start every possible egg should be put down, and no time wasted. It sometimes happens that we have to buy eggs for the early hatches, but this is generally very unsatisfactory, for we find that many are unfertile, or the chickens die when hatched. This may be due to bad mating, and bears out what I have said about the care that should be taken in the mating of the stock. It may suit our purpose best to put the eggs in an incubator, and then rear in artificial brooders, but for this kind of work I prefer the hen; at the same time I find that one or two incubators are very useful to take surplus eggs, and the broods may be made up in this way. If the hens are used we must be quite sure they are properly broody, and it is well not to entrust them to eggs until they have been well tried on dummy eggs for a couple of nights, for at this time of the

**Rearing Ducklings in Brooder.***[Photo by S. C. Sharpe.]*

year they are rather liable to get broody for a day or so and then to lose the inclination to sit, and if a hatch of eggs has been placed under her they will be spoilt. Should the hen or pullet be found to take kindly to the nest, then the eggs may be placed down, but not before the nest has been properly made up. This is the secret of success in hatching with the hen. Unless the nest is made in the right way we shall not have good results during winter hatching; any slipshod way may answer in the warmer weather, but not when we are getting frost every two or three days. A flat nest is of no use for early hatching; the nest must have a well-hollowed centre, a hollow so that all the eggs have a tendency to roll towards the centre of the nest, then, if the hen does not pull all the eggs under when going back upon the nest, none of them will lie outside and get chilled. I prefer to use sitting boxes out of doors in some well-sheltered corner, say under a thick hedge; but if in a shed, then have an earthen floor. The hens sit better in such places; and above all we must see that the place is undisturbed and quiet. All hens should be dusted with some kind of insect powder before being put on eggs, and this more especially during the warmer months of the year, for insect life on the hens is fatal to a successful hatch. The number of eggs to place under the hen must be somewhat regulated by the size and breed of the bird; but the ordinary cross-bred, or Sussex hen, which I advise for this purpose, will cover 13 or 15 eggs at any time of the year, and such a number may be put down. She should have good attention while sitting, and be taken off to feed once a day at a regular time. A feed of Indian corn or wheat or oats may be given, and she should be allowed to remain off the nest for 10 to 30 minutes, according to the state of the weather; but if fine and not too cold it is far better to keep the hen off a good time, as it gives the eggs a good airing and will make a stronger hatch. During the last day of incubation it is better to leave the hen quite alone, and she will sit two days without food and take no harm.

#### MANAGEMENT OF CHICKENS.

Now we are perhaps coming to the most difficult part of the work, and a part which must have a good deal of individual attention, for we must remember that a very small matter may cause the death of the whole flock. Regular attention is the point to bear in mind, not so much constant attention, but all the feeds to be given at a set time every day: the birds then get to know when to expect their meals, and will grow far better, and keep fit and healthy, than when fed at any time of the day.

#### SHELTERS FOR COOPS.

I particularly want to mention the advisability of having artificial shelters for the coops, or fosters, as the case may be, but we will deal first with the rearing in coops. A brood of 15 chickens may be placed out with every hen, if she is a good mother and a fairly large hen, and they should have some kind of shelter placed on the lee side of the coop, so that when they come out to feed the keen winds are kept from them.



This is one of the most important points in early rearing, and if more generally adopted there would, in my opinion, be far fewer losses among the early broods.

The shelter shown in the photograph on page 48 is made something like a thatched hurdle, and answers the purpose well, besides being very inexpensive; it is about 2 feet high and 3 feet long. This gives nice shelter, and is easy to move when moving the coop to fresh ground, and it gives the chick a chance to take every advantage of the sunshine, when there is any, and also keeps them from the cold winds. There would be far less pneumonia amongst chickens in the winter and early spring if these shelters were more generally used.



*Photo by S. C. Sharpe (Instructor).*  
A group of Students. Killing and plucking demonstration at the  
Agricultural College, Uckfield

The next question with the rearing which I want to deal with is with reference to water for chickens. I contend that they will get on far better without water in the first part of the season; this applies where soft food is used, and when bringing up chickens for the table only a little grain should be given; the birds grow faster and the flesh is better by using soft food. It may be all very well to bring up foster chickens on dry food, and is an excellent plan where the poultry keeper has only an hour or so a day in which to attend the chicks, because then the dry food can be put down and the chicks left to get it as they require it; but if we are bringing up birds for fattening we must have soft flesh, and this can only be procured by feeding on mash; therefore water is not needed, and will cause more harm than good; there is sufficient moisture in the soft food to supply the wants of the chick, and more than this must be harmful. Again, if a chick is not in condition, generally it will be found to have a certain amount of fever—it may be

lung trouble, or it may be bowel trouble ; in both cases there would be a considerable amount of fever—then, if the chick takes a lot of water it is very bad indeed for it, and most probably will cause death. Another point again against water is, that should the ground be liable to have the gape worm in it, the water will be conducive to the spreading of this troublesome complaint, especially if the vessels in which it is used are not kept in a very clean state.

#### FEEDING THE CHICKENS.

I shall not be able to deal with this subject as fully as I would like, owing to want of space, but I may mention that it is important to feed with care, and to feed for producing the best table flesh ; a chicken which is to be fed for table should be brought up on a different diet to one which is to be reared for show or stock purposes, and unless properly fed from the shell it will not fatten so well, or so readily.

The first food should not be given too soon, say 24 hours after the chick is out of the shell. This is quite as soon as they should be fed, for we find the yolk of the egg undigested even after six days on making a *post-mortem* on a chick which has died and has had bowel trouble, from which so many young chickens die ; therefore it teaches us that the bird is supplied by nature with food for some time after its exit from the shell, and many poultry keepers would not lose the number of chickens if they were less kind to them in the early stages.

The best food to start a batch of chickens with is “ Egg Food.” The unfertile eggs which are tested out from the nest or the incubator will do for this purpose, and should not any of these be available, fresh eggs may be given. It may seem somewhat expensive, but if it is the means of saving mortality amongst the batch it is worth using.

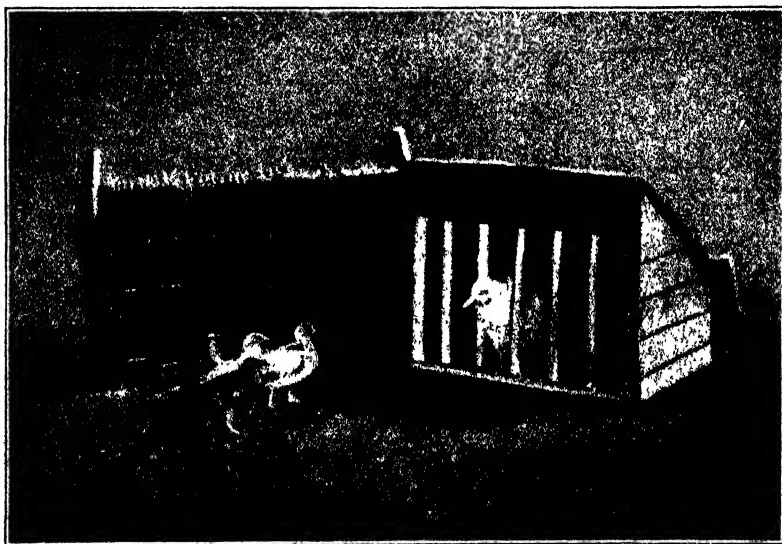
The eggs may be boiled hard and broken up in the shell, and with a little scalded biscuit meal will form a capital food for the first few days. I should add that it is well to give some chopped green food in with this mixture, and I would like to state here that if more care were taken to use green food there would be far less mortality among the young chickens hatched early in the spring ; they are unable to get anything of the kind in the natural state, especially when there is frost on the ground, and consequently the liver does not perform its proper function, which means that the chick is soon suffering from bowel trouble, and in a short time will be beyond recovery. No, I am quite convinced that my *post-mortem* work would be much less amongst chickens if poultry keepers realised the value of green food. Savoy cabbage or Brussels sprouts leaves are good, also onion tops, or even the Spanish onion if it is cut up fine and mixed in with the soft food.

One other point in connection with feeding I would like to mention before I leave the subject, and that is, the constant use of flint grit. Enough has been written perhaps upon this subject, but I still find people trying to rear chickens without the use of grit. Some say that there is enough in the land upon which the birds are cooped to

supply the needs of the birds, but I find very little land with enough grit upon the surface to supply the young chickens, and I would strongly advise every poultry keeper to buy some very fine flint (sharp) grit, and put it down in a vessel of some kind, the very first day of putting the chickens out in the coop or foster; and if this was more general, the birds would go on far better.

After they get a few days old the diet may be more simple and less expensive, for we must keep in mind that to make the rearing of spring chickens pay a good profit, the food bill must be kept as low as is possible without starving the birds.

Ground oats should form the principal article of diet after the first few days, and these should be well cut up and have very little husk in them; if there is much husk it may cause a stoppage in the crop and the bird will starve to death, although having plenty of food to take. Here, again, green food will help, as it will aid digestion. Biscuit meal

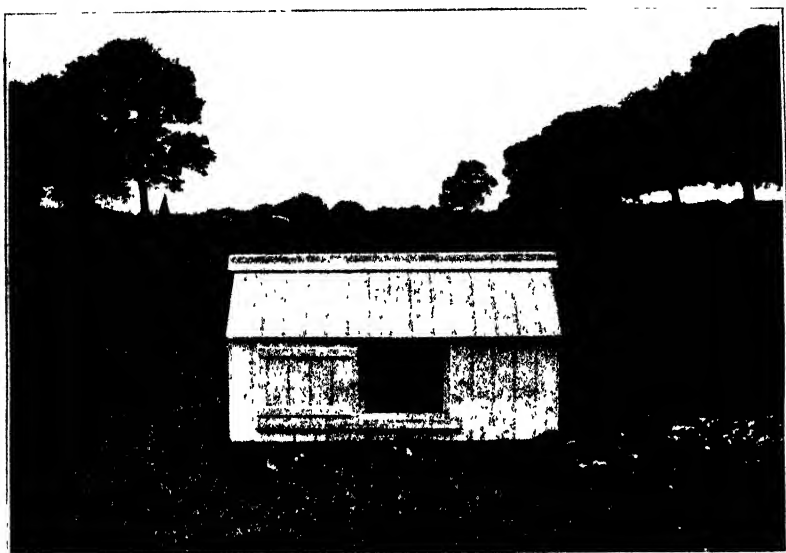


A Shelter for Coops. 2 ft. high 3 ft. long.

[Photo by S. C. Sharpe.]

should be given, and it should be well scalded before mixing with the meal; it then forms a very digestible food, and one which the chicks will grow well upon.

If milk is available it is splendid to use, and can be mixed in all the soft foods. It will whiten the flesh, and a bird which has been milk-fed can always be detected on being killed, the flesh is pure white; and not only is the colour good, but the flavour of a milk-fed chicken is better than any other.



A Sussex Chicken Ark    Improved pattern

*[Photo by S. C. Sharpe.]*

I am showing a photo of a "Sussex Ark." These arks are used in this county by most of the Sussex breeders, and are very fine for housing the youngsters at about eight or nine weeks old. The one shown is an improvement on the common "Sussex Ark," and gives more free ventilation; and when breeding chickens which are wanted for early killing, it must always be remembered that they must have plenty of room at night, and the ventilation must be free.

In conclusion, I would like to say that every farmer and small-holder who has a little land available, and has the health and strength and some time to spare to give to the work, cannot do better than try to breed a few hundreds of spring chickens for the London markets, and I am quite sure that he will be able to say that this branch of poultry keeping pays as well as any other branch of farming.

## THE DAIRY CONFERENCE IN IRELAND, 1913.

By WM. J. GRANT, Chairman of Conference Committee.

List of members present :—

Messrs. \*S. Palgrave Page (*President*), Eltham, Kent; \*W. J. Grant (*Chairman of Committee*), Newport, Mon; Mr. and Mrs. R. Austin, Twynholm, N.B.; Mr. J. Archer, Bishops Lydeard, Som.; Mr. and Mrs. F. Batho, Ellesmere, Salop; Messrs. Frank Brindley, Congleton; Frank Bryan, London; W. J. Browne, Romford, Essex; J. H. Burton, Weston-super-Mare, Somerset; A. E. Büesing, Hildesheim, Germany; Isaac Butler, Newport, Mon; E. W. Caddick, Ross, Hereford; Vernon B. Chalk, Beckenham, Kent; Mr. and Mrs. E. H. Clarke, Leicester; Mr. Nathaniel Coates, Hillesden, Bucks; Mrs. E. and Mr. A. D. Comyns-Lewer, *The Feathered World*, London; Messrs. H. W. Cowell, Elmdon, Essex; W. A. Cowley, Brighton, Sussex; Mr. and Mrs. Hugh W. B. Crawford, Castle Douglas, Kirkcudbright; Mr. J. L. Curtis, Streatham, London; Mr. and Mrs. W. Dale, Acklam, Middlesbrough; Miss Margaret T. Dougall, Bonnybridge, Stirling; Messrs. Loudon M. Douglas, Edinburgh; J. B. Ellis, St. Ives, Hunts; J. T. Evans, Gillingham, Kent; Miss Jane Forster, Nantwich, Cheshire; Mr. Albert E. Frost, Croydon, Surrey; Mr. and Mrs. L. Goldsmith, Bury St. Edmunds; Messrs. Wm. Graham, Marlesford, Suffolk; \*F. E. Harcastle (*Secretary*), 28, Russell Square, London; F. Hellings, Croydon, Surrey; Sidney Hole, Hassocks, Sussex; Miss P. M. Hunter, Ballybreak Dublin; Mr. and Mrs. Charles Ibbott, Oakley, Beds; Messrs. J. R. Keeble, Manningtree, Essex; G. A. Keen, London; W. Langridge, Tunbridge Wells, Kent; John Lee, Ellesmere, Shropshire; Miss Lee, Ellesmere, Shropshire; Mr. D. MacNicol, Abergyle, Donbigh; Mr. and Mrs. J. G. McMyn, Kirkbean, Kirkcudbright; Miss A. D. McKerrow, Garforth, Lanes; \*Mr. and Mrs. Wm. Nisbet, Glasgow; Mr. and Mrs. A. G. Nye, Penshurst, Kent; Mr. and Mrs. Charles Robinson, Marton, Yorks; Miss Robinson, Marton, Yorks; Messrs. Andrew Sloan, *The Scottish Farmer*, Glasgow; Alex. Smith, Edinburgh; Mr. and Mrs. J. Thistleton Smith, West Barsham, Norfolk; Mr. and Mrs. Anthony Spedding, Keswick, Cumberland; Mr. and Mrs. Frank E. Still, South Norwood, Surrey; Miss Hilda M. Taylor, Aberdeen; Alderman and Mrs. Martin Taylor, Croydon, Surrey; Messrs. S. Taylor, Linton, Cambs; Joseph Tickle, Chatham, Kent; John W. Towler, Farsley, Yorks; R. J. Venner, Reading, Berks; Bernard N. Wale, Newton Abbot, Devon; J. H. Wale, J.P., Newton Abbot, Devon; \*Eldred G. F. Walker, Chew Stoke, Somerset; A. E. Watson, London; Mr. and Mrs. F. J. Wigmore, Oxford; Mr. G. P. Williams, Scorrier, Cornwall; Mr. and Mrs. William Wood, Limpsfield, Surrey; Alderman W. H. Woods, Preston, Lanes; Miss E. M. Woods, Preston, Lanes; Mr. and Mrs. James Wyllie, Dumfries; Mr. F. V. Wynn, Edgbaston, Birmingham.

On the evening of Saturday, May 17th, 1913, the majority of the members attending the Conference arrived by the mail steamer at Kingston where they received greetings from some of their Irish friends, but especially so from the President of the British Dairy Farmers' Association, Mr. S. Palgrave Page, who, with that inborn tact and courtesy which has won for him

\* Indicates Committee.

a regard and popularity right well deserved, was also on the Pier head with Mr. F. E. Harcastle, the Secretary, who, with the President, arrived the previous day so as to make sure that everything was ready for the comfort of those who came. The evening was fine, the crossing enjoyable, and to all intents and purposes, if one can judge from appearances, the fates were propitious for a pleasant time in the Emerald Isle. Quickly we were all comfortably seated in the carriages reserved for us in the boat train, and the pretty run along Dublin Bay through Blackrock was soon accomplished. Arriving at Westland Row, conveyances were in readiness to convey everyone to the hotel at which they were to be quartered during what proved to be a most pleasant, enjoyable, and instructive visit spent amongst those of whom for many a long day there will, in the truest sense, be a more than pleasant recollection of by every member of the Conference.

As the most has, as it always is, to be made of the time at the disposal of those who are responsible for the arrangements of our Dairy Conferences, every one was under command to be in their place for dinner at the Gresham Hotel promptly at 7.30 p.m., where we were honoured by the presence of Their Excellencies the Lord Lieutenant of Ireland, the Countess of Aberdeen, the Right Hon. T. W. Russell, M.P., Earl Carrick, Sir Christopher Nixon, Bart., representing the Royal Veterinary College, Sir Joseph M. Grath, Mr. R. Carden, Hon. Secretaries Royal Dublin Society, Mr. R. A. Anderson (Secretary Irish Agricultural Organisation Society), Professor Carroll, Professor R. Campbell (Assistant Secretary, Department of Agriculture), Mr. R. J. Moss (Registrar, Royal Dublin Society), Sir Nugent Everard, Bart., Mr. James Talbot Power, D.L. Professor James Wilson, Royal College of Science, and other gentlemen personally interested either in Irish Agriculture or in aiding and furthering the scheme of Agricultural Education throughout Ireland, of which Professor Campbell has just cause to be proud of.

Mr. Palgrave Page, President of the Association, presided, and in a few short felicitous terms gave the King and Lord Lieutenant.

The Lord Lieutenant in responding, welcomed the Association and spoke in complimentary terms as to the far reaching and useful work that had been accomplished by the Association, not only in furthering and protecting the interest of those actually engaged in dairy farming, but also in the pioneer work in Dairy Education initiated and carried out with unqualified success at Aylesbury. Lady Aberdeen, who has done so much in aiding and furthering the fight against Tuberculosis in Ireland, on being invited to speak, gave a brief outline of what had been accomplished in battling with this dreaded disease. Her Excellency reminded those present that Ireland was the first country to have a Commission to inquire into the milk supply, whose report would, there was every reason to believe, contain recommendations that would compel attention. Lady Aberdeen's very apt reminder to all who had the advantage of hearing was the fact that in Ireland there were 250,000 goats, and that in the improvement of those animals lay a great means of providing milk for a portion of the population who could not get it otherwise. The Right Hon. T. W. Russell, M.P., Vice-President of the Department of Agriculture, in responding to the Agriculture of Ireland, agreed with the proposer that truly the whole face of Ireland was, up to the present time, being surely and steadily changed for the better; those who knew Ireland fifteen or twenty years ago and the system of cultivation then in vogue would to-day more fully realise what had been so actually accomplished for the benefit of the whole country, farmer, workman, and the trader. Mr. Russell strongly urged the necessity for the consideration of Agriculture in Ireland, and that three-fourths of Irish Education should, in a literal sense, be in its fields in the way the Department of

Agriculture was now so earnestly endeavouring to aid the country. Some apt and very trenchant remarks about the Dairy Produce Bill then before Parliament and the most unfortunate outbreak of foot and mouth disease concluded an address that justified the marked and careful attention it received.

Mr. R. A. Anderson, who also responded, said that he wished the great Irishman, Sir Horace Plunkett with whom he had worked for the past twenty-three years, had been present, and reminded the proposer of Success to Agriculture that to-day it was not altogether a misfortune the sending of young men across the seas to strengthen their great Empire and to build up something greater than that could build up at home. At the conclusion of the speaking, their Excellencies, with other guests, remained for some time, thus adding greatly to the enjoyment of an evening, the recollection of which will be extremely pleasant.

The next morning, Sunday, 18th May, was just what it should be, a fine typical Irish morning, plenty of sunshine, a clear blue sky with a soft gentle breeze, just such a one as you might expect to meet on an early summer morning blowing off Dublin Bay. Everyone was up early, for those who had not the advantage of being in Dublin before had much to see, while those who were not strangers had either friends to look up or to renew their acquaintance with many a place or spot for which there was still a warm corner in their heart for old association's sake. It was a busy morning, some to St. Patrick's Cathedral, others to rub their shoulders at dear old Trinity again, while some who knew the ropes found their way to Howth, Killiney, or even a little further down on the Wicklow side of Dublin Bay; all however, had received due notice from Mr. Hardcastle, our excellent Secretary, that if they were not, each of them separately and individually, at the appointed place at 2.30 p.m., they would not be taken to Kilteragh that afternoon, a warning, notwithstanding the many other attractions, that was religiously observed. Promptly at the appointed time motor cars were at each hotel to convey the whole party through an exceedingly pretty and picturesque route to Kilteragh, Foxrock, the home of Sir Horace Plunkett, one to whom Ireland not only to-day but for all time will owe so much. The drive extended to beyond Foxrock and gave everyone an opportunity of seeing some especially fine coast and inland scenery for which the Wicklow side of County Dublin has always been famous, and much it was enjoyed, although only the fringe was reached. Sir Horace had with him Mr. R. A. Anderson and a large number of friends, including Professor Carroll, one who, like his host, had for so many years given of his best for the advancement and bettering the position of those who had to live by their industry on the land in Ireland. In passing one might add what a grand example Professor Carroll is of a man who does all things well, whether it was in England as the chief of a great reformatory, a popular and shrewd land agent, or in his native land as a pioneer of Agricultural Education, at Glasnevin in particular or the Munster Institute, always could be found and seen the resulting work of a strong man who tempered all he did with that spirit of human kindness that makes peace and sunshine for all. Sir Horace's pleasure in receiving his guests was only equalled by the pleasure of some at meeting him again, others of seeing, in his beautiful home, one whom they felt it was an honour to meet. Kilteragh is a wonderful combination as a dwelling, quaint and picturesquely built, and designed in such a way as to gather during the whole day every particle of available sunshine. It stands on a fine elevation commanding a wonderful uninterrupted view of Dublin Bay, with a grand expanse of mountain scenery; the grounds are laid out something after Italian style and are planted with a view of obtaining a

natural effect in keeping with the house and its surroundings. The interior of the house, it goes without saying, is in keeping with the tastes of its distinguished owner; at the same time, although some object of beauty meets one at every turn, in the truest term peace and comfort for all within this home speaks to one everywhere. After tea and after everyone had spent an enjoyable afternoon, Mr. Palgrave Page conveyed the thanks of the party to Sir Horace Plunkett, who, in a few brief but well chosen words, explained the great pleasure it was to receive and welcome in his own home those whom he hoped would have a very pleasant time in Ireland, at the same time regretting that his health unfortunately would not permit him to join the Conference during its stay in Dublin. Once more the motor cars were again filled, and, after three ringing cheers, a start was made for Dublin, thus concluding the first day of our Irish visit.

MONDAY, MAY 19TH, like the previous day, was all that one could desire; early breakfast was the order of the day, with prompt attendance at Nelson's Pillar, where special trams were to convey the party to the Albert Institute, Glasnevin. On arrival there Professor Campbell, Mr. Stephenson, Mr. Drew, Mr. Pimlott, and other officials of the Department of Agriculture met the party, who were at once divided into different groups so as to avoid either crowding or confusion. The first matter of interest to note was that Glasnevin as a place of instruction has been in existence since 1837, and that the first building was erected in 1834; Ireland therefore is entitled to the credit of making the first attempt at Agricultural Education in Great Britain. At Glasnevin the farm is 170 acres in extent, half of which is in tillage and the other half in grass each year; the rent of the farm is at the rate of £4 per Irish acre; the portion under grass one year, except the old cow pasture of 30 acres, is under tillage the following year. The whole of the crops on the farm were simply an object-lesson of high class, but at the same time profitable farming from a strictly commercial standpoint. The Dairy Shorthorns, 32 in number, were to all appearances typical dairy cattle and excellent milkers who, up to the number of 35, are grazed the whole year on this fine old pasture; in addition to the dairy shorthorns, there is a small herd of pure bred Scotch Shorthorns kept for the purpose not only of showing the students what the two types of shorthorns are like, the beef producer and the dual purpose animal the one that gives milk and is also a beef producer as well. The average cost price of the dairy cows seen in such fine condition was £20 per head, the average milk record for 35 cows was 803 gallons, the highest from one cow being 1,300 gallons in the year. A daily record of the milk given by each cow is kept, the best milkers being retained, those who do not come up to the standard are sold, and frequently either bull or heifer calves from the best milkers are purchased at big prices by those who are now alive to the fact that pure-bred dairy shorthorns are the best breed for dual purposes on the farm. Pigs and poultry also receive attention, and examples are to be found at Glasnevin equal to any that are shown in the Kingdom. The fruit plantations, kitchen garden, and the covered-in space where the crossing of cereals and other hybridisation is carried on were not only a source of interest but an object-lesson to more than one member of the Conference party. It would appear that the students at Glasnevin might be divided into three classes: first those who came from their respective counties for a one-year course; next those who came for a two years' or longer course; and last, but not least, the horticultural students. The first lot are young fellows who gain a scholarship or have done well either in the classes in their own county or at one of the agricultural stations of the Department, and have the good fortune to find themselves at Glasnevin, where they not only receive a training that enables them to understand the principles that underlie practice, but they are also taught both to realize and



believe that there is a true dignity in real work; the result is that these young fellows go back to where they came from not only better men but true missionaries of agriculture. The next set are men that may be better off or can spare a longer time. Then comes the man who is to be a Horticultural Instructor: in addition to being taught the best principles of gardening, including pruning, propagation, and hybridising, he also receives a scientific training as well. The result is we have a body of thoroughly trained men who are not ashamed to work, who, when they are sent out, will be in a position to almost compel those whom they are to instruct, to put into everyday practice methods that are advantageous to themselves. Then a further advantage at Glasnevin is, I believe, that any student of exceptional ability is given encouragement by the hope of being passed to the College of Science in Dublin. The fine lot of young fellows that were at work in the garden, fruit plantations and new hybrid plants bred and raised at Glasnevin again reminded me very forcibly of the fact that if farmers were really good gardeners they would know far more about the requirements of the crops they grow, the cultivation of the soil, and be better agriculturists. The house space is utilised to the uttermost, but comfort, discipline and *esprit de corps* is only too evident everywhere, there being room for 60 students in the establishment, and bearing in mind that it is for the benefit of those who, it is earnestly hoped, will be the backbone of Ireland in the future, the wise and far-seeing policy has been adopted of always giving precedence to the farmers' sons who receive State aid to enable them to receive the excellent training that they do at Glasnevin. The cost, I believe, to the young farmer is £15 per annum, but to the son of a commercial man £50. There is also a scheme open to the whole of Ireland by which twelve scholarships are awarded each year; at the last competitive examination 100 young fellows competed, with the result that eleven agricultural and two horticultural scholarships were awarded. I saw some of these young fellows, and from the impression I formed and the remarks I gathered from members of the Glasnevin staff there can be no doubt as to the great and far-reaching results that will be achieved from what was being done at Glasnevin. Time passed quickly, and too soon we had to leave, but before doing so a hearty vote of thanks was accorded to Professor Campbell and his more than able lieutenant, Mr. G. Stephenson, for a morning well spent and thoroughly enjoyed. Both of these gentlemen responded, and in conclusion Professor Campbell called for three cheers for Professor Carroll, Ireland's grand old man, who was loved and respected by all, and one who had for years longer than he would care to count created by his administration and forethought the Albert Institute, Glasnevin, to which so many Irishmen owe so much. The response was as it should be and worthy of the one to whom honour was shown.

At 2.30 p.m. that afternoon the Conference party were on their way to Mr. Bertram H. Barton's beautiful place, Straffan House, just inside the border of County Kildare. The drive was a pretty one, through the Phoenix Park and Lucan, thus giving many a picturesque glimpse of the river Liffy and an opportunity of seeing many of the snugly-sheltered gardens in which strawberries, early potatoes, peas and salad are grown for the Dublin market. Some excellent farming was also seen, in addition to horses and cattle that many an English county might well be proud of. The afternoon was delightful; the young summer greenery, with the perfume of hawthorn, gave added enjoyment to everyone. The village of Straffan speaks without words for itself, and evidence that for many generations past the squire and his people had lived and died in peace and goodwill, knowing and believing that while each and all had their allotted place to fill in life, still there was, as there always should be, a mutual interest in each other's well-being. At the

entrance to the Domain Mr. Barton and his factor (Mr. Thomas Milne) were waiting to receive and welcome the visitors who had come to see the largest and perhaps one of the most utilitarian breeds of cattle in Britain, for here were to be found both the shorthorn for beef, the dual shorthorn in the truest sense of the term, and last, but not least, the unique and wonderful herd of Dexter Shorthorns founded and built up by Mr. Milne at Straffan, where he had the control of affairs for three generations. For the convenience of the visitors, and to save time, drafts of the two breeds were placed in convenient but separate pastures, so that we could the more easily inspect either the yearling heifers, two-year-olds, and the matrons and the sires. The first lot to be inspected was a wonderfully beautiful lot of two and three year-in-calf heifers, all of which were got by the following bulls:—Scottish Boy 87290, Notlaw Dreadnought 103226, and Scottish Chief. Many of the heifers gave promise of making dairy cows, possessing, as they did, all the characteristics that a dairy cow should have; they had plenty of hair, smartness and style with well sprung ribs—sure indications of hardiness and constitution. Passing on to another pasture, the first animal that caught our sight was the grand old veteran Scottish Boy, carrying his age of eleven years far better than many a sire does at half the age. He was a wonderful animal, with a great thickness of flesh, a mellow touch, grand quarters with a top like a dining table; no wonder that an animal like this at eleven years old should, five years ago, have won the male championship of his breed at the Royal Dublin Society's Show at Balls Bridge. In the same pasture were to be found some of the matrons of the herd with their daughters; taking the fine ten-year-old cow, Straffan Moonlight, and her six-year-old daughter, Straffan Clarice, the third prize cow at the Royal Dublin Society's Show, April, 1913, we have examples of what has been accomplished for many years at Straffan, while amongst the young matrons one could not help admiring Straffan Ideal and her companion, Straffan Farewell. Next we came to the yearling heifers, most of whom were the daughters of Scottish Boy; a beautiful lot they were, and if we may venture to say so, a proof that Mr. Milne never parts with a sire too soon, a precaution that is unfortunately too often not put into practice. In a large pasture further on were to be found as fine a lot of pure bred Dairy Shorthorns as we could wish to see, in perfect health, with an abundance of hair and well formed udders; here we had an opportunity of seeing real pure bred dairy shorthorns, the descendants of such sires as Prince of the Lillies 59689, Prince of the North 68149, and that wonderful Bull, Beadsman 60349, who was as great and grand an animal as his namesake Sir Joseph Hawley's grand horse Beadsman, winner of the Derby in 1851, I think. In addition to Scottish Boy the sires that commanded attention were the wonderful shortlegged Butterfly bull Auchnacree Buck 104583, and Choice Goods of Craigwillie of the Pansy family, who is a son of Imperial Eclipse 99181. There was throughout the whole herd a wonderful family likeness, possessing all the indications of long, careful, and judicious breeding, with the result that a tribe of shorthorns has been founded excellent alike for the grazier or the dairy man. Practically all the cows are milked, therefore the calves must be reared by hand. Having seen the shorthorns, the next—and a great attraction it was—were the Dexter Shorthorns, truly a wonderful sight one that, with all due respect, astonished more than one of our party. The shorthorns both by their number, usefulness and uniform excellence throughout gave us something to think about, but those wonderful little cattle, for all the world like miniature shorthorns, to use a nautical term, took the wind out of our sails. Here was a herd started by Mr. Milne more than forty years ago from one or two Dexter cows, perhaps mother and daughter, with a shorthorn cross; then year in and year out this wonderful herd, or, to speak correctly, tribe, has been built

up, till to-day we saw a herd of cattle unique and distinct from anything else in the world. The Straffan Dexter Shorthorn is an animal that possesses all the best characteristics of the shorthorn and the Dexter Kerry; it may be, perhaps, that they are a trifle larger in size than the Dexter, but not much—their hair, colour, and form are exactly the same as that of the pure-bred shorthorn. They are wonderful milkers, hardy, and make excellent beef, equal in quality to anything produced, while the skin of a Dexter shorthorn will make leather that will hold its own with anything tanned in the kingdom. Further, what an increased number of these wonderful cattle can be kept on the same land that would be required to graze a far smaller number of cattle of any of the larger breeds; it can also be safely assumed that there is no other breed or race of cattle that will equal in weight with size with the Dexter shorthorns, also bearing in mind that their milk, although produced in quantity, is of equal quality to that of the best shorthorn milk. May one not, therefore, venture to suggest, that in these days when small holdings are to be a salvation in England, Co. Kildare, through the skill and foresight of a Scotchman, has created and established a breed of cattle better adapted for what should be the small owner and not the small holder than any other breed in the world. Unfortunately time waits for no one, the cattle had been seen, but wonderful as they were, there was still much to be seen and admired. A visit to the gardens completed a more than enjoyable afternoon; trees and shrubs, herbaceous plants, beautiful paths and well-kept lawns spoke volumes for the goodwill and the pride in one's home and people that for all time existed at Straffan. Tea was waiting for all; Mr. Barton, with some of his friends, saw to everyone's comfort. An appreciative vote of thanks was given to Mr. Barton by the President of the Association, the mounting of the motor cars followed, and with ringing cheers the party wished Mr. Barton and his beautiful home good-bye.

Dublin was again duly reached, and, after a hasty dinner at the various hotels, the members of the Conference and many others foregathered at 7.30 p.m. at the Royal College of Science to receive an address of welcome from the Right Hon. T. W. Russell, M.P., Vice President of the Department of Agriculture for Ireland, and afterwards to hear a paper read by Professor J. R. Campbell on Agricultural Development in Ireland. The President of the Association, Mr. Palgrave Page, presided, and after the Conference had received a very hearty welcome from the Vice-President of the Department of Agriculture for Ireland, Professor J. R. Campbell read a most able, interesting, and instructive paper (see page 70). Mr. W. R. Crawford, Castle Douglas, N.B., moved, and Mr. Langridge seconded, a vote of thanks to Professor Campbell, after which the whole party had ample opportunity of seeing the various Departments of the College of Science; but the special interest seemed to be centred in the seed testing and analytical laboratory. Much as we saw and appreciated, with perhaps a slight amount of kindly envy, if there is such a thing, the Commander-in-Chief ordered the whistle to be blown, which meant good-night, and so ended a long, most pleasant, and instructive day.

TUESDAY, 20TH MAY, at 10 a.m., found most of the Conference party (with a possible exception of a few ladies, I think, who will probably have some recollections) at the Theatre of Leinster House, kindly lent by the Royal Dublin Society, who, through Mr. Edward M. Archdale, D.L., welcomed the Conference both to Dublin and Leinster House. Mr. Palgrave Page, President of the Association, presided. Mr. Archdale, in welcoming the members of the Conference, gave an interesting outline of the history of the Royal Dublin Society, pointing out that Doctor Madden

started premiums in Ireland in 1740 ; in 1761 £125 was given for agriculture and planting, £546 for manufactures, and £150 for fisheries ; in 1879 the Royal Agricultural Society of Ireland, which is now merged in the Royal Dublin Society, sent the late Canon Baggot abroad, and from that sprung Co-operative Creameries and everything else. The Royal Dublin Society had now 3,500 members, and on their behalf he bid them a hearty welcome. The Rev. Father Findlay, as Vice-President of the Irish Agricultural Organisation Society, on behalf of Sir Horace Plunkett, gave the members of the Conference a most hearty welcome, whom, he hoped, would see during their visit how the creations of science, results of research, and improvements in technical methods had been made available to the humblest farmer in the country. The following papers were then read :

- (1) The Elimination of the Unprofitable Cow (Professor James Wilson, B.Sc.), see page 78.
- (2) Irish Co-operative Dairying (Mr. R. A. Anderson, Secretary Irish Agricultural Organisation Society), see page 83.

A discussion took place after the papers had been read. The members of the Conference afterwards took Luncheon by invitation of the Royal Dublin Society, under the presidency of Mr. Archdale, at which 200 or more guests were entertained. The magnificent collections of cups and trophies of the Royal Dublin Society were displayed, which were greatly admired by the guests, but especially the Queen Victoria Cup, presented on the occasion of the Royal visit in 1900. After luncheon the whole of the Conference party made their way by tramcar and otherwise to the dépôt in Fleet Street, where the Department of Agriculture and Technical Instruction carry out the surprise butter competitions--a scheme that has been in existence for at least two years. Truly this was an object-lesson in the truest sense to the visitors ; whether they were interested in commerce, creameries, agricultural, or dairying education, there was a lesson given that might well be taken advantage of. There were 106 examples of butter staged or entered for competition from various creameries in Ireland, all of which were called for by telegram at the same time from the various creameries, the week before May 12th, so that not only should the creameries be unaware as to when their exhibit was required, but for obvious reasons that each creamery exhibit should be judged under all-round conditions that were exactly the same. In every instance these exhibits are kept in the store from a week to ten days before they are judged, so that if there are any defects in any of the butter sent the faults shall become fully pronounced by the time the judging is to take place. The awards are made by judges of the highest repute in the trade in the Kingdom, and come from the various important markets to which Irish Creamery Butter is sent-- for instance, the butter seen by the Conference Party had been judged by merchants from Liverpool and Glasgow. On the next occasion the selection would probably be from the Midlands and the North of England ; in every instance the men selected being only those held in the highest estimation in the trade. Each judge scores independently, and each entry is placed in its position according to its commercial value on the market, either in England or Scotland, the scale being as follows :--

Flavour	...	...	...	60 marks.
Texture	...	...	...	30 marks.
Colour	...	...	...	5 marks.
Packing and finish	...	...	...	5 marks.

Total ... 100

It has been found that as a rule the judges agree about the very best and the worst butter that they have to judge and value, but the secondary types are only too often difficult to agree about as to place and value; this fact might be taken as a useful hint to the creamery managers. It must be borne in mind that each exhibit is turned out and thoroughly examined as to weight, packing, and percentage of water: the average percentage of water in 1,600 samples was 12·8. When the figures giving the results from each competition have been carefully checked, parties of creamery managers and others interested in the dairy industry, including dairy teachers, are invited to come up—part of their expenses being paid by the Department—to see the butter from the various creameries, and to see for themselves not only the awards, but the reasons why, from a commercial and consumer's point of view also, they were given. Here certainly was to be found another example of the thoroughness of everything that Professor Campbell takes in hand. By the invitation of His Excellency the Lord Lieutenant, a visit was now made to the Viceregal Lodge, which was reached by a pleasant drive through the historic Phoenix Park. His Excellency, who received the party on their arrival, had invited a large party of distinguished people to meet the members of the Conference, amongst whom were, in addition to the Viceregal Party, including the Earl and Countess of Carrick, the Right Hon. T. W. Russell, M.P. and Mrs. Russell, Mr. and Mrs. T. P. Gill and Miss Gill, Professor and Miss Carroll, Professor and Mrs. Campbell, Mr. James Power, Professor Wilson, Sir Nugent and Lady Everard, Sir Fred and Lady Moore, the Earl and Countess of Mayo, Viscount and Viscountess Powerscourt, Sir Charles Cameron, Sir R. T. Butler, Sir A. and Lady Coote, Sir Joseph and Lady McGrath, Sir J. and Lady Kennedy, Lord Massey, the Right Hon. Mr. Commissioner Wrench and Mrs. Wrench, Mr. and Mrs. Bertram Barton, Colonel and Mrs. Sharman Crawford, Mr. and Mrs. Archdale. The well-kept grounds were bright with early flowers, the brilliancy of which was toned down by the soft greenery of the young foliage; added to this the effect was still further enhanced by the presence of so many ladies who in themselves, with their pretty costumes, gave that finished charm such as they alone can give. It was only too evident in going through the Viceregal domain that the Countess of Aberdeen had a love for animals; foremost was to be seen a score or more of well cared-for Toggenburg goats, all of which looked like good milkers, while in the kennels were to be found dogs young and old such as Aberdeens, West Highland, Skye and Carn Terriers with also some fine Highland sheep dogs, in addition to which Her Excellency had some Persian and tortoiseshell cats, of which she might well be proud. The following trees in the grounds were looked at with much interest: a fine example of Irish oak (*Quercus robur pendiculata*) planted by Queen Victoria in September, 1853, a Wellingtonia planted also by Queen Victoria in 1861, and another specimen of Wellingtonia planted by His Royal Highness Prince Arthur, K.G., K.P., on 27th April, 1869. The meeting of old friends, the making of new acquaintances, and listening to good music, created a wish often felt—Oh, that time did not go so quickly. In words that conveyed only too well the feelings of all his friends our President conveyed to the Earl of Aberdeen thanks and appreciation for His Excellency having so kindly asked the Conference to his home. Lord Aberdeen said he was delighted to have an opportunity both of making the personal acquaintance of every Member of the Conference and to give them a right hearty welcome, and wished the Conference fine weather and a pleasant time in Ireland. His Lordship also conveyed Lady Aberdeen's regret at not being present, as she had the previous night to leave for London. A very pleasant drive through the "Phoenix" as it is affectionately termed, brought us back to our respective Hotels in Dublin, thus ending the third

day of the Conference, which so far, thanks to the fates, fine weather, the whole-hearted kindness and hospitality of our Dublin friends, not forgetting either the generalship of our President and the well-thought-out arrangements of the Secretary, Mr. Hardcastle, had been greatly appreciated by all.

WEDNESDAY, MAY 21ST: An early breakfast at 7 a.m., which meant we were to reach Kingsbridge Station at 8 a.m., where some of us had to say good-bye once more to Dublin, still taking with us many pleasant memories both of the present and the past. The Great Southern and Western Railway had a special train ready to convey us down to Thurles, where special arrangements had been made for the Conference Party to see the well-managed Creamery, and also the beautiful crochet and art work that was being made at the Presentation Convent. At the station those who wished to visit the Creamery went their way, and those for the Convent followed their bent; had time permitted, it appeared that the work seen by the ladies of the party who had the advantage of visiting the Convent so well repaid those who had the pleasure of seeing it that many others would have liked to have visited the Convent also. The creamery at Thurles is one of the many well-managed Co-operative dairies now to be found throughout practically the whole of Ireland. It is well managed, the arrangements in every way are thoroughly sound and practical, nothing is done for show or ostentation but simply to maintain a good reputation and obtain the best results for those on whose behalf the Creamery is worked and really belongs to. 1,800 gallons of milk per day was being dealt with. The average price for the butter produce in April of this year was 114/9 per cwt.; for the butter produced during the whole of 1912, 113/9 per cwt. The prices to be paid for milk are arranged each month, and all separated milk that is not taken away for calf-rearing sells usually at one penny per gallon. At 11.20 the whole party met again at the station, where our special train was in readiness to convey us through a rather picturesque bit of country to the ancient town of Cashel, situated at the foot of the rock on which rests one of the best preserved combinations of Cathedral, Castle and Round Tower in Ireland, where, on arrival, we had the first taste of Irish ram. The great height of the Rock of Cashel on which stands the Cathedral, the Castle adjoining, and the Round Tower, Cormac's Chapel with the vicars-choral buildings, is an outstanding object of interest that can be seen from a great distance in every direction, while the view from either the rock itself, or better still from the upper wall of either the Cathedral or the Castle, is very fine indeed. Here we have an example of the ecclesiastical and martial government that obtained in the days of old, for the earliest ecclesiastical record relates to Cormac, a Prince who was also a Bishop, born A.D. 831 and slain 903, while in 1127 the beautiful little Romanesque Church, in such wonderful preservation even now, was founded by Cormac McCarthy, King of Desmond, who was also Bishop of Cashel: truly in those days there were soldiers of religion who had the courage of their faith. It may not be out of place to give a brief description of what must be recognised as one of the remaining national and ancient monuments of Ireland, although this be a Dairy Conference report. The ruins of Cashel are in the townland of St. Patrick's Rock and the parish of the same name. The place was occupied about the beginning of the fifth century by the King of Munster, who fortified it, and thenceforth it took the name of Caiscal or Cashel, from the stone fort then erected there. The oldest building on this site is the Round Tower now incorporated with the Cathedral, forming a picturesque addition at the north-east angle of the north transept; there is, however, now no trace of the early Church to which the Round Tower formed an adjunct. Next to the tower in chronological order is the beautiful Cormac's Chapel, founded 1127, already alluded to, which contains the finest and most perfect example of Romanesque work in Ireland; the Nave and Chancel are covered by steep-pitched stone roofs constructed on the corbel principle,

each having a chamber between the external stone roof and the internal stone vault. The first church, in accordance with historical records, was founded in 1169, when Donald O'Brien, King of Limerick, is said to have founded a new church in which, in 1172, Henry II. received the homage of the founder. The present Cathedral is on the site of Donald O'Brien's church, and is of a date one century later, and occupies the whole space between the Round Tower and Cormac's Chapel, which was connected with the east side of the south transept of the Cathedral, thus forming a suitable chapter room to which access was gained by means of a doorway opened in the west gable of the chapel from the south transept, and also by another doorway into the chapel through the north tower. The Cathedral was burned in 1495 by Gerald, Earl of Kildare, who had a grudge against the Archbishop, and defended the act of burning when called to account for it before the King by saying that he thought the Archbishop was inside. The Rock of Cashel was taken by Cromwellian soldiers under Lord Inchiquin, in 1647; the Church was left in a ruinous condition for a time, but was repaired in 1686, and restored as a Cathedral in 1729; in 1749 it was unroofed, a new building having been erected. The vicars-choral buildings were erected apparently in the 15th century with alterations in the 17th century; the architecture is of a domestic character. Vicars-choral as a rule were laymen appointed to assist in chanting the service, and were sometimes minor canons attached to the Cathedral, and originally were eight in number, afterwards reduced to five, when a change was made, appointing clergymen as honorary vicars; this continued till 1836, when they were abolished. Rain commenced to fall as we made our way to the town of Cashel from what was a citadel of stern religion and warfare, but yet a shelter to God's acre, where in centuries past, and even to-day, so many have been and are being taken to their last earthly resting-place. If only those ancient stones could speak what a tale they would unfold. A hasty luncheon at the City Hall, and at 1.45 we were mounted again, some in jaunting-cars and other in brakes, for Killenaleck, to visit the Knockavardagh Co-operative Creamery and Cheese Factory. The drive was a long one, and a mighty wet one into the bargain, but nevertheless it gave a very excellent opportunity of seeing something both of the farming and the conditions under which those who cultivate the soil in that part of County Tipperary live, and stock their farms, notwithstanding the downpour. The roads were not by any means first-rate, and those who were in the foremost brakes had an interesting hour not far from Laffans Bridge to wait the arrival of the party. On reaching Knockavardagh the weather improved, and a more than hearty welcome was given to everyone by The Revd. Father Richard Fennelly, chairman and founder of the Creamery, The Revd. Father P.B. Quinlan, and Mr. John Quigley and other directors, including Mr. T. M. Gleeson, the excellent manager, also Mr. T. J. Kennedy the honorary secretary, with many shareholders. This creamery might well be taken as an example of what can be accomplished in a remote and almost inaccessible district by a determined attempt to deserve success; it must also be most gratifying to the department to hear and receive not only personal acknowledgment for the help and advice given, but also to find the same specially mentioned in the Directors' Report for 1912. The quantity of milk purchased during 1912 was 7,634,906 lbs., average of butter fat 3.50; quantity of butter made 311,329 lbs., average price f.o.r. 114/11 per cwt.; possible price payable for 1 lb. of butter fat 13.34d., average price paid per lb. of butter 13d. or 4.70d. per gallon of milk. The Members of the Conference from the West of England and counties that have taken up the manufacture of Caerphilly Cheese instead of Cheddar must have been a little surprised to find such a splendid lot—and in no small quantity—of Caerphilly Cheese that would command a ready sale and a good price in any market in Wales, where this cheese is most in demand.

The following authenticated fact speaks for itself. In 1912, 44,327 gallons of milk from which Caerphilly Cheese was made produced, after all manufacturing expenses were carefully deducted and the value of the by-products accurately estimated, £97 15s. more than an equal quantity of milk converted into butter and sold at 114/11 per cwt. would have realised. At the time of our visit the cheese was realising at Cardiff, Newport, and Highbridge, Somerset, 53/6 per cwt. net. About 500 gallons of milk per day was used for cheese-making. The butter is sent practically over England. 80 per cent. of the separated milk is taken back for calf-rearing and other purposes, the remainder is disposed of for domestic and other purposes. 307 farmers are supplying the Creamery with milk, most, but not all, being shareholders. The butter was excellent and was certainly appreciated by all at the enjoyable tea to which we all received an invitation and a more than hearty welcome from the genial Father Fennelly, of whom his people might well be proud. In addition to butter and the manufacture of Caerphilly Cheese, the feeding of pigs, with the collection and sale of eggs, are also dealt with at this excellently managed Co-operative Creamery, which has been run with profit and advantage to the countryside for more than 22 years. The name, the big hillside, from which most of the milk is obtained for cheese-making, is Kolmillack—or in other words “Hill of Honey and Milk.” A hearty vote of thanks to The Revd. Father Fennelly and those who had spared neither pains or trouble to make our visit a pleasant one, brought the inspection to a close, with the fact that those who cared to do so should have found that even at an old-world place like Killenaule there was something to learn. On reaching Laffans Bridge Station a train was ready to take us to Limerick, where in due course we arrived at the scheduled time 6.47 p.m., and if the truth was told, others besides the ladies were not sorry to reach one of the most prosperous towns in the South of Ireland. It is unfortunate, perhaps, but some of us really do not enjoy too much exertion. After dinner the Members of the Conference, with several gentlemen who had taken a great deal of trouble in assisting Mr. Harcastle to make the arrangements for the Limerick part of the Conference, went to the Royal George Hotel, where a concert had been arranged. Mr. Palgrave Page, the President, was “Commander-in-Chief,” and opened the proceedings by welcoming those visitors who had done so much in making arrangements for the Limerick visit. Miss Dougall, Mr. Burton, Mr. Harcastle and some Irish friends played and sang, while, during the intervals, recitations and a few short speeches contributed to a thoroughly enjoyable evening.

ON THURSDAY, MAY 22ND, it was pleasant to wake up and be able to feel that there was not a train to catch that morning, for, at the reasonable hour of 10 o'clock, there was to be a Conference at the Royal George Hotel, when Mr. A. E. Poole Wilson was to read a paper upon a subject with which if any man was conversant with he was, that is, on “The Irish Dairy Industry” (see page 89). The discussion travelled over a wide area—from Turkeys to Caerphilly Cheese, Scotch *versus* Irish-bred cows for milk, the wisdom of judging cattle by points—and the very pertinent remark by Mr. Caddick at the close of the discussion in reminding our Irish friends that the dairy cow must be judged first by inspection then by the quantity and quality of the milk given. Those who remained for the Conference and who had not gone out to purchase Limerick lace were soon on their way to Messrs. Cleeve Bros.’ large condensed milk and butter-making factories, which were a sight worth seeing and not likely to be forgotten. The amount of butter made each day is from 8 to 10 tons, and is sent out in bricks, 28 lb. and 56 lb. pyramids, and also in 112 lb. keels. Some of the butter is sent out absolutely unsalted to markets that we would not have thought of—Liverpool, Manchester, and also Leeds and Birmingham. Brine is not used in the manipulation of butter



here. Cream is only disposed of as a rule for the Irish trade; the milk on arrival is heated up to 160° then separated, after which the cream is pasteurised and weighed. Messrs. Cleeve Bros. have 78 receiving stations for milk they purchase; the number of gallons of new milk received annually is about 25 millions, butter produced annually about 4,100 tons, condensed milk produced in 1-lb. tins, equivalent to about 27,000,000; the number of hands employed about 2,000, while in addition to the manipulation of this huge quantity of milk, the tins for the condensed milk and the boxes in which both the condensed milk and butter are to be packed for market are made from the raw material on upper floors in the same buildings in which the milk is dealt with. The next visit in Limerick was to Messrs. Shaw's Bacon Factory, where, in addition to the curing of thousands of pigs annually, there is now an enormous business carried on in what may be termed preserved provisions. Those who had the privilege of going through all the various departments in this fine establishment must have been very forcibly struck, not only by the magnitude of the business, but also by the absolute and beautiful cleanliness that was to be found everywhere. Had time permitted an establishment such as this well repaid the time spent on it, through the courtesy of the proprietors. We next made our way by special train to Adare, where, by the kind permission of Lord Dunraven, opportunity was given to see Desmond's Castle, the ruins of Adare Abbey, founded in the year 1465, with many other things, all of which naturally added to the enjoyment of a thoroughly interesting day. The village of Adare is picturesque, possessing a fine church and all the appearances of prosperity and thorough contentment. On reaching the Park or Domain gates, before entering the beautiful grounds, everyone was presented with a dainty box of cigarettes made from tobacco grown by Lord Dunraven—a kind thought that was very much appreciated. Close to the entrance to the Domain is to be found Desmond's Castle, that at one time was the home of the race from which the Desmonds, including, I believe, the Earls of Dunraven as well as the Earls of Desmond, have descended. The Castle is well preserved and cared for, but is only one of the many things of interest to be found in this delightfully secluded stretch of green turf, and so finely timbered and watered by the flowing Shannon, a river dear to the heart of every Irishman. The next object of interest was the still standing remains of what was once a beautiful church that had, in spite of the desecration and outrage of years gone by, not lost that unspoken dignity which so truly points to where reverence once was made to the great Architect who judges all things so wisely. Passing on over beautiful turf and amongst fine timber we found ourselves admiring what was once a Franciscan Abbey, while yet further on, close to Shannon's bank, was to be found Adare Abbey, founded in 1465; that also belonged to the Franciscan Order. This was even, in its day, more beautifully designed than the first alluded to. The tower was placed in the centre, and, although the building was not a large one, care, great taste, and judgment must have been bestowed on the edifice by those by whom it was built. When taking a last look at what was once God's house, one could not help being forcibly struck with the appearance and vigour with which a fine, self-grown yew was raising its head near the centre of the Abbey, well above the surrounding walls. A quarter of an hour's walk and Lord Dunraven's home was reached. The house has a fine and commanding effect, that is all the more strongly impressed upon one's memory by the words engraved on the side that faces each morning the rising sun: "Except the Lord build the house, labour is lost that built it." "This goodly house was erected by Windham Henry Earl of Dunraven, and Caroline, his Cousin, without borrowing or leaving a debt." "Love God only, honour and obey the Queen, avoid evil and do good." The entrance hall is wainscoted in oak; the mantelpieces are built of fine Connemara marble, with fire-dogs for the burning

of wood only. For family service there is an organ; while the hall and staircase find resting-places for an Irish elk head, Irish harps, elk horns, elephants' tusks, &c. The library is extremely long and more than rich in the collections of family pictures, oak seats with quaint, carved images; marble busts of distinguished statesmen, soldiers, and lawyers. The cabinets and stalls are all wonderful examples of carving, each being carved with a different subject. The pity again was that time pressed and gave little time to admire many of the things to be seen in this house so full of beautiful things. On through the grounds we were now taken to see the Osier Beds. It would appear that in the first instance a mistake was made as to the kind of willow planted, as it is absolutely necessary that the willow grown must be of a kind or kinds that will not break in bending. Several kinds had been planted on trial recently. The newly-planted willows are usually ready for cutting either in the second or third year after planting. The willows make hoops necessary for half-hundredweight butter casks, besides being used for basket-making. The tobacco-growing was interesting, and quite a new object-lesson to many of the party. The young plants were ready to plant out from the hotbeds on which they had been raised; the crop is ready for gathering in September; when harvesting, the better kind of leaf is selected for special tobacco. There is a very well-lighted drying-shed for Turkish tobacco and a closed one for the ordinary type. It must be borne in mind that, no matter how careful the cultivation may be, the final condition of the product depends upon the curing. It is found that tobacco can be grown on a small holding at a gross return of £30 per acre, £15 of which, it is estimated, goes to the grower. The tobacco is sold to the dealer at about 5s. per lb. From the tobacco we wended our way to a large tent in the grounds, where, on Lord Dunraven's behalf, Mr. Ballingal, the agent for the estate, had tea ready, which was much appreciated. A vote of thanks was conveyed to Lord Dunraven, through Mr. Ballingal, who was also thanked for the great pains and trouble he had taken to make the afternoon so pleasant for every member of the party. On the way to the train some of the party paid a flying visit to the Black Abbey Creamery, which they considered to be another example of what Lord Dunraven and Sir Horace Plunkett were doing to foster in this country the great truth that a real sturdy attempt to better themselves by a personal effort deserves success. In the evening, those who had done so much to make our visit to Limerick and their county what it was, both a pleasant and instructive one, joined the whole of the Conference party at dinner at Cruises Royal Hotel, where a most enjoyable evening was spent: speeches, music, and song, with just that sparkle of fine good humour, the true inheritance of Irishmen, closed the last evening to be spent in Limerick.

Early on the morning of FRIDAY, MAY 23RD, we went first by train to see the well-managed Ardagh Co-operative Creamery, where a large volume of milk produced in the district is dealt with on the same lines as the other creameries that had been visited. This, however, was one of the oldest creameries in the South of Ireland, and does a very large parcel post business in butter, for which, during the year 1912, as much as 1s. 3d. per lb. had been obtained without the postage. At the time of our visit the price was 1s. 1d. excluding postage, and butter was being posted to regular customers in Lancaster, Marlborough (Wilts), Farnham (Kent), Ross (Herefordshire), Weybridge (Surrey), Godstone (Surrey), Chiswick (London), and Inver-gordon (N.B.) The farmers, nearly all of whom are shareholders, are 300 in number, and cover a radius of more than five miles. The greater part of the milk is brought to the creamery in donkey-carts. Some of these wise and intelligent animals would be started on their own; they would arrive at the creamery, go up to the receiving platform, wait till the milk churn was taken off the cart, and then go round in their turn to the other side, wait till the churn

containing the separated milk was put on the cart, and when told to go on would start for home. Truly we have here a fine illustration and example of the intelligence and faithfulness to its employer of the Irish ass. The member of the Conference party who, at Limerick on the previous morning, when Mr. Poole Wilson read his excellent paper, raised the question of breeding improved asses in Ireland, must have felt extremely gratified to find that on arrival at Ardagh we met on the road a cavalcade of fifty-four excellent donkeys intermixed with seventeen small ponies and mules. The farmers in the district had some very useful milking cattle, and several members of our party wandered a distance to see the stock. One of the number, Mr. E. H. Clarke, went so far that, had he not chartered a donkey-cart, churns and all, that came into the station at a gallop, he would have lost his train, which was on the move. A cheer greeted his arrival, and so enabled Mr. Clarke to go to Listowel, where we were to be taken on the Lartigue Mono Railway, the only one of its kind in the kingdom, to Ballybunion, a watering-place at the mouth of the river Shannon. On reaching Listowel, a train on this wonderful line was waiting for us. The carriages were like sidecars, and each carriage had to be entered from the side it faced. An upright continuous bar of iron along the line supported the engine and carriages, the wheels running on a very narrow line of small rails. Ballybunion has the reputation of having excellent air, and being a good sea-side place either for invalids or children; the coast is interesting. There is also near the town a fine stretch of sand, while further on there is fine rocky scenery with some rather large caves. A considerable quantity of seaweed is thrown up by the tide on the beach, which is secured by the farmers and used for potato growing. Those who wished had an opportunity of seeing in the district some excellent Dexter and Kerry cattle in their native county, and all who took the trouble to do so before and after luncheon could have seen an exceptionally fine lot of Kerry cattle at the station on their way to the North-East Agricultural Show at Belfast, in which were selections from the fine herd of Mr. David Rothery, J.P., Gartonsby, amongst which were to be found the following animals:—Taking first the Dexters, Punch III., a winner of three first prizes and so far never beaten. With this animal was a beautiful Dexter heifer, a yearling, Hero III., first in her class at the Royal Dublin Show in April. Gart Winnie, a winner of eleven first and two second prizes, including the Blythwood Cup, who gives  $4\frac{1}{2}$  gallons of milk a day, and has had seven heifer and two bull calves. The Kerry bull Gart Prince has a record good for his breeder and owner: he is two years old; first at Ball's Bridge, Dublin, as a yearling; third as a two-year-old; but first at Belfast, though third at Ball's Bridge. Damson III. was a fine four-year-old cow, and a good milker; also Countess III., a young-looking six-year-old cow, who had to her credit three first, two second, and one third prizes, also a good milker. Therefore, although this was a day of comparative leisure, there were many useful opportunities of both learning and seeing something of Irish home life, stock and farming, in the counties of Cavan and Kerry. At three o'clock we left Ballybunion behind, and after a short wait at Listowel, where we had, before leaving for Killarney, an excellent opportunity of seeing many of the womenfolk on their way home from the market at Listowel dressed in their wonderfully picturesque shawls, for which county Kerry is so famous. With a run of  $2\frac{1}{2}$  hours we were all glad to find ourselves at Killarney, looking forward to seeing the mountains and lakes.

The morning of SATURDAY, MAY 24TH, at first looked rather threatening, but after the morning had warmed itself the sun came over the mountains and just made up its mind that Killarney, its mountains, woods and lakes should look their best, as they certainly did. It was decided that we were to divide into two parties—one to ascend to the lakes, starting from Ross Castle

by boats, and the other party to be driven to Kate Kearney's Cottage, near the famous gap or Pass of Dunloe, where they would mount ponies and ride to Brandon Cottage to meet the party that came up the lakes, have luncheon together, and exchange ponies for the boats. The ride through the mountains was splendid, the sunshine and shade brought out and enhanced the rugged grandeur of the mountains and enabled the naked eye to see sheep grazing on spots on the rocks on which there did not seem to be a foothold. On the lower and damp spots near the roads and bridle paths there were brilliant patches of the beautiful butterwort (*Pinguicula grandiflora*) flowering with the freedom of the bluebell in Robinhood's country, or the primrose on the banks of a Devonshire lane. A ride that from its enjoyment seemed too short brought us to Brandon Cottage, close to the first lake, where we dismounted and made down to the boats, which already had arrived with the other party. We had luncheon, and commenced the journey down. The mountains on the left, coming down the lake and facing south-east are very grand, and are timbered to the water's edge. On reaching the middle lake we saw the spot that was immortalised by Dion Boucicault in his play *The Colleen Bawn*. The heroine (Eileen O'Connor) in this play was the daughter of a ropemaker, a very beautiful girl, who became a servant on Dion's Island, where one of the scenes in the play is laid. Out of this lake the boats passed under a narrow bridge into the lower and larger lake of the three, where on the left side, in a pretty sheltered corner, may be seen Glenna Cottage, in which Queen Victoria lunched with her host, Lord Kenmare, on the occasion of her visit to Killarney. From this lake another fine glimpse of distant mountains in the direction of Muckross is to be had, and the white spire of the cathedral is to be seen through the trees. The Highland firs, yews, arbutus, holly and oak growing on the water's edge were reflected in the clear water, while the grey rocks covered with moss and lichen added much to the rugged charm of the scene. Bare and perhaps barren as some of the mountains looked, upon them are to be found, I believe, red deer, hares, badgers, foxes, wild cats, martins, grouse, woodcock, and snipe: in the lakes salmon, trout, eels, perch, and flounders are plentiful. Ross Castle was reached and an inspection was made, and another look from the tower of the Castle taken, and we wished the beautiful lakes good-bye, feeling more than delighted and charmed with all that we had seen, while the fact that Professor and Mrs. Campbell were at Ross Castle to greet us on our return gave yet an added charm to a day already so pleasantly spent.

SUNDAY, MAY 25TH, gave some an opportunity to meeting friends and to make their devotions. Some took a long drive in directions opposite to that taken on Saturday, and several availed themselves of seeing Mr. John Neill's fine herd of Kerry cattle at The Park, Killarney. At 7.30 we said good-bye to Killarney, departing for Cork, where we arrived at 9.20 p.m.

AS MONDAY, MAY 26TH, was to be a busy day, orders went forth for an early breakfast, and that everyone should be in readiness to start for the Munster Dairy Institute promptly at eight o'clock. The morning was a fine one, sunshine tempered with a pleasant breeze from the Atlantic blowing inland over Queenstown and the harbour. The drive to The Munster, as it is termed by all who either know or have had the advantage of being taught there, was a pleasant one, while those who had made on this occasion their first visit to County Cork could not help being favourably impressed with the excellent land and the crops upon it. On arrival at the Institute the party was received by Professor Campbell and Miss O'Clery, the Lady Superintendent, who succeeded Miss Sheedy, and now so ably fills one of the most responsible posts of the kind in the kingdom. The internal arrangements of this fine Institute, though simple, were excellent; the comfort and individual well-being of every single student apparently received the same thought and

attention, possibly in some instances even more than if they were in their own home. Anyone who has a personal knowledge of an institute such as this could see at a glance, first at the students themselves and next at the whole surroundings, school or classrooms and cubicles, that everything in connection with the whole place was thorough; while those who went through a regular course there, unless it was their own fault, would receive a training which would endow them with such knowledge as would make them more fit to fill their proper position in life than otherwise they possibly could have obtained. In the kitchens, cooking and baking was in progress—that is, the food for consumption in the house. Not only was the cooking being done as it is in England by the aid of coal and a range, but also with turf fires and such cooking utensils and materials as might be found in the smaller homes either in the poorer or even better-off districts in Ireland. Here again the sound common-sense scheme for agricultural training was only too evident to the eyes and understanding of those who would only see. In the dairy, where instruction is given by Miss Doyle and Miss Webber, it was just the same, separator and end-over-end churn; but whole milk has to be churned in many a poor home for the sake of the buttermilk—a fact that is not forgotten as one sees the long-handled churn in the dairy also. Passing out of the dairy to another wing the laundry is found in full swing, turning out work that would surprise many a so-called sanitary laundry, where one's clothes after a few visits appear as if they had been through a threshing mill first and then rolled out on a butter worker. In addition to laundrying needlework is also taught just as thoroughly as everything else. From the laundry we next went to the garden, to find a score of the students who wished to learn how to grow fruit, flowers, and vegetables, either at home or in homes that it was hoped some day would be their own, hard at work on plots for which they were responsible. Well, the crops were a credit to those who grew them, who, smart and winsome as they were, it was plain to see were neither afraid nor ashamed to work. In the fine fruit plantation, facing the main entrance to the Institute, is a fine apiary, kept for a twofold purpose—the fertilisation of the blossoms on the fruit trees and to give the students a knowledge of the way and manner in which bees should be managed. The Poultry Department is under the control of Miss L. Murphy, who has under her charge what is perhaps the largest and most important Poultry School in the Kingdom. There are in these runs practically every breed that is of any real value, either for the purpose of producing pure-bred stock or for crossing for the purpose of breeding birds for the table, in addition to which all the best egg-producing breeds also receive attention, as do killing and trussing of poultry for market. The distribution of eggs at a moderate price to small-holders throughout the whole of Ireland for hatching is another important matter—one that has been the means of establishing the right breeds of poultry in remote districts where otherwise such a result could not have been accomplished. In addition to establishing the right breeds of poultry in this way, something like 2,000 chickens are hatched for distribution in the same manner, being sent away at a day old from 700 stock birds that are mated and put up for this purpose. The poultry students not only pack the eggs sent away, but also make the boxes for the transport of both eggs and chickens. Ten breeds of poultry are being tested in the laying competition that is being carried out. From the poultry we next were taken in hand by Mr. Kennedy, who is giving such a good account of himself as farm manager; he took the party over the farm. The fine herd of Dairy Shorthorns attracted a good deal of attention, it being noted that here, as unfortunately it is not the case everywhere, the cows, when their season of milking is over, are not despatched to the butcher. A record tabulating the milk from each cow is kept, and the large number of calves reared is a more than useful lesson to the girls being taught. A glance at the

piggeries gave some of those whose large cheese dairies in England necessitates their feeding a large number of pigs, an opportunity of seeing a fine lot of Large Yorkshires. A whistle blew and a muster was made to start for Clonakilty to inspect the farm and Agricultural Station there. Everyone was pleased and loud in their unstinted praise of what they were more than justified in thinking, that the Munster Institute outvalued anything of its kind they had ever seen. In due course, by rail, jaunting-car, and brake, the Agricultural Station at Dromagh, Clonakilty, was reached, this being one of the half-dozen such stations that have been established by the Department of Agriculture for Ireland in various parts of Ireland. This farm has an area of 366 statute acres, the rent is £200, and there are on the farm 50 milk cows, 20 to 30 two-year-olds, 40 calves, 50 ewes, 70 lambs, 20 hoggets (shearling ewes, tegs), 9 working horses, including 4 brood mares, 6 young horses, and several pigs; it is at an elevation of 400 feet above the sea-level and faces the Atlantic. Mr. Adams is in charge of the station. The session is of ten months duration, commencing in October and ending in August, and the fees are on a sliding scale according to the valuation. Where the aggregate valuation does not exceed £20, the cost per session, including tuition, board, and ordinary medical attendance, is £3; exceeding £20, but not £40, £6; exceeding £40, but not £100, £10; but where it exceeds £100, the fees would be £15. The house in which the apprentices live is large and comfortable, there being accommodation for thirty; the farm buildings are also just what they should be, sufficient and no more. The young fellows who come here do so in the truest acceptance of the term, to serve an apprenticeship in farming. Those who apply for an apprenticeship must not be less than seventeen years of age, and each must give an undertaking that it is his intention to become a farmer in Ireland. Preference is given to applicants from the province of Munster, it also being considered necessary that the applicant should produce a satisfactory certificate from the Agricultural Instructor of the county in which he is living; and if an applicant has not attended the Agricultural Classes in his county, he must first pass an examination before he can be accepted as an apprentice. The young fellows seen at this station all take part in the work on the farm—milking, dairying, gardening, and everything else; but this is not all; in the evenings and at other times, when out-of-door work is not very pressing or when the weather precludes out-door work being done, English, arithmetic, including surveying, book-keeping, and technical agriculture are taught, not for the purpose of examination, but to, as far as possible, make those young fellows, who are to be the future backbone of Ireland, intelligent business men in addition to being good farmers. Professor Campbell only spoke the truth when he told us that this was one of those institutions where they did not attempt to devote too much time to what they called laboratory work—they considered the best laboratory work was outside on the farm. The garden here is a large one, worked and cultivated by the apprentices, one portion being cultivated in the style that must still exist in many parts of Ireland, and the remaining portion in the way that well-managed gardens are under ordinary circumstances and conditions cultivated, and with such tools and contrivances as were within the reach or in the possession of everyone. If one thinks for a moment as to what the consequent effect must be from the work that is being done at this station, which is a school and a well-managed farm also, the only possible reflection will be that the result of the training received here will be, as I have already said, that the majority of these lads will be the mainstays, in their separate counties, of that industry by which alone their country exists. Luncheon, which was provided by the Department of Agriculture, was presided over by Professor Campbell, who extended a very hearty welcome to the visitors. The President of the Association, Mr. Palgrave Page, in proposing Professor

Campbell's health, expressed the appreciation which those he represented felt at the kind hospitality which had been shown them by the Department. Professor Campbell, to whom with Mr. Wilson they were indebted for the continued hospitality shown to the members of the Conference since they reached Ireland, had both done all they possibly could to make their visit in every sense a happy and pleasant one. These gentlemen had earned their gratitude, and he was sure the Association would remember for many years to come the genuine kindness with which they had been received in Ireland. Professor Campbell briefly replied, thanking the visitors for their appreciation, and, like every good general, in no unflinching terms gave tribute to those who were responsible for the good work that was being done at Clonakilty. Afterwards the members of the Conference and apprentices again went through the stock and to see the crops, and particularly the fine stretch of early potatoes. Tea followed, and once more the party, after a rousing cheer, were again on their way to Cork. The return route to the town of Clonakilty was in the opposite direction to that of the morning, thus giving a fine view of the Atlantic with a breath of sea air. In the evening the Lord Mayor of Cork, Alderman Henry O'Shea, Mr. Daniel Horgan, J.P., T.C. (Chairman of the Cork Butter Market Trustees), Professor and Mrs. Campbell, Miss O'Clery (Munster Institute), Mr. R. G. Cox (Secretary Cork Butter Market), and others were entertained to dinner at the Imperial Hotel, Cork, the President, Mr. Palgrave Page, presiding. The health of his Majesty King George V. Patron of the Association, having been duly honoured, the President gave the toast of "The Lord Mayor of Cork." After the toast had received the usual honour, the Lord Mayor said he could not express in words how proud he was to be present on such a delightful occasion, and to extend to the visitors the hearty welcome of the citizens of Cork. Mr. E. W. Caddick proposed "The Department of Agriculture," coupling with it the name of Professor Campbell. Professor Campbell, who was most cordially received, first expressed his personal thanks for the courtesy shown him by the Members of the Association during their present visit to Ireland, and then said that before long he believed that the Agricultural industry in Ireland would have developed much more than it had even up to the present; he also felt that during the short time the Conference party were in Ireland they had not an opportunity of realising the whole of the work that was being done by the Department. He had met during the week many old friends and made some new ones. Mr. D. Horgan, T.C., propose the toast of "The British Dairy Farmers' Association," saying that on behalf of the people of Cork he, with the Lord Mayor, extended to the Association a very hearty welcome to Cork. Mr. John Lee responded, saying that they, from an educational standpoint, had learned a great deal from what they had seen; further, that their education had been considerably enhanced. The Chairman of the Conference Committee (Mr. W. J. Grant) proposed the last toast of the evening, "The President," whom he said was a tower of strength to the British Dairy Farmers' Association, not only as their President, of whom they were proud, but also as Chairman of their most important Committee—the Finance Committee—and last, but not least, Mr. Page was one of those men who did all things well that he undertook to do. The President said it was quite true that he took a very great interest in the Association, and if his services had been of any value, he was more than satisfied. With regard to their visit, he could only re-echo all that had been said by previous speakers—all that it was possible to do had been done for them to in every way make their stay in all respects most enjoyable. Before concluding, he would like to say a few words about their Secretary, Mr. Hardcastle. They were very much obliged to him for the excellent work he had done in connection with the Conference, the manner in which he ha

managed its organisation added greatly to the pleasure of their visit. During the evening several members of the Conference party contributed songs, which were thoroughly appreciated, the pleasant evening, which was the last at which the whole party would meet, being brought to a close by the singing of Auld Lang Syne.

TUESDAY, MAY 27TH, was spent by a visit to the famous Butter Market of Cork, where a fine, large show of butter and cheese was staged for inspection by the Market Committee, after which some of the party wended their way to the Blarney Castle and also to kiss the Blarney Stone. To those who did we surely wish "that a sweet, persuasive tongue has been given to them." At 3.30 we gathered up our traps, and sought a corner in the waiting train with more than pleasant recollections of ten days spent in Ireland that will not be forgotten for many a day. Thus ended another Conference that was not only thoroughly enjoyed by everyone, but also gave to many an opportunity of seeing how much education has done and is doing both for Agriculture and the people in Ireland, and also the great debt of gratitude, not in Ireland alone, which is due to those who have given of their best in no untiring measure to encourage their countrymen to "endeavour by their own efforts to deserve success."



## AGRICULTURAL DEVELOPMENT IN IRELAND.

By PROFESSOR J. R. CAMPBELL, Department of Agriculture and Technical Instruction for Ireland.

MANY important changes have taken place in Ireland since the last visit of the British Dairy Farmers' Association in 1899. Indeed, these have been so great, and their consequences so far reaching, that it is no exaggeration to say that you have come back to view an entirely new Ireland. This evening I can only mention the most important of these changes and give you a sketch of that particular phase of our agricultural development with which I am personally associated. Though the dairying industry is your chief interest, I feel sure that you will not consider it altogether foreign to the object of your visit, nor time wasted, if I attempt to picture a few of our activities in other branches of agriculture. The tour upon which you are entering will afford many opportunities of discussing in greater detail those branches in which, as an association or as individuals, you are specially interested.

At the outset I wish to emphasise the point that there are factors in the agricultural situation here which are not sufficiently realised by visitors from Great Britain. Unless these are kept constantly in mind, and their full significance appreciated, you will never be able to understand the agricultural development of the past; nor will you grasp the inner meaning of our policy and procedure, both of which in many respects differ widely from your own. Whenever you have visited a foreign country and heard around you a strange language, the very atmosphere has prepared you to anticipate fundamental differences in agricultural as well as in social conditions; but when you come to Ireland you insensibly seek to interpret everything in terms of the conditions prevailing in your own country. I can, however, assure you that, notwithstanding its proximity, rural Ireland is in some respects as different from Great Britain as any of the countries you have visited. Some of the differences indeed are so subtle as to be only appreciable to those who have spent years in the country and have learned to look at things from the native point of view. It is useless to argue, as do so many of my friends from across the Channel, that that point of view might with advantage be altered. There is nothing in this country so fixed, so unchangeable.

Let me mention two obvious conditions which differentiate Ireland from Great Britain as they afford a key to the better understanding of much of our work. The first is what I may describe as the immobility of our farmers. When you are dissatisfied with your surroundings or with the terms on which you hold your land you do not hesitate to seek a more desirable holding. Your daily papers offer you a choice of vacant farms; and you may take a lease of one

in your neighbourhood, in an adjoining parish, or in a distant county. There is, indeed, amongst you at certain terms, a sort of "general post." This is a matter of pure business in which sentiment plays little or no part. You have, too, your Agricultural Holdings Act, which facilitates the process by arranging terms of compensation for improvements between you and your landlord. In Ireland the custom is far different. There is no Agricultural Holdings Act, no changing of farms, but there is an unbounded sentiment, altogether praiseworthy, but utterly inexplicable to the British mind, which roots the family in the holding and makes it for them more difficult to migrate to an adjoining county than to emigrate to the United States. No one who fails to grasp this simple fact can ever understand Irish land problems.

The second point I want to emphasise is the great proportion of our farms which by you would be classed as very small holdings. Most people overlook the fact that whilst you have in Scotland about 78,000 holdings, and in England and Wales about 430,000, in Ireland there are over half a million, of which more than 350,000 do not exceed 30 acres, and of these about 220,000 do not exceed 15. It will be at once obvious, therefore, that the form and extent of State aid here must necessarily be very different from, and I may say more effective than, that in a country of large self-contained farms. Remember, too, that, as I shall show immediately, the State here has become in effect the landowner, and as such would naturally be expected—for the present at any rate—to play the part of the philanthropic landlord.

Returning to the changes which have taken place in Ireland since your last visit, I may mention three of special note, viz., the great extension of land purchase, the development of co-operation, and the work of the Department of Agriculture and Technical Instruction for Ireland, or as it is generally called, "The Department." Of the creamery movement I shall have a little to say in dealing with the Department's work. Of it and of the co-operative movement generally you will hear more fully from Mr. Anderson and from Mr. Poole Wilson; but as the question of land purchase is not otherwise dealt with in your programme, I would like to give you in a few sentences the present position and effect of the Land Purchase Acts.

Briefly, then, I may say that under the Land Acts of 1903 and 1909, about 315,000 agreements by tenants to purchase their holdings have been lodged, involving advances from the State to the amount of 95 millions sterling. This is in addition to 75,000 holdings for the acquiring of which, under earlier Acts, upwards of 25 millions sterling were provided. Accordingly a total of 390,000 peasant proprietors has now been created by means of advances from the State to the extent of 120 millions sterling. There are, however, about 550,000 agricultural holdings in Ireland, so that some 160,000 still remain to be dealt with. Such a vast scheme of land settlement could not be effected without great changes in social and economic conditions. Changes have indeed taken place, and these distinctly for the better. Though the main Land Acts are of too recent date to allow of their

full effect being made manifest to visitors, yet to those of us who are engaged in agricultural administration the reform is very apparent. It is not merely by what the farmer has done, but by the spirit in which he is attempting to improve, and by the rise in his standard of living and in his brighter outlook on life, that we who are on the spot measure the strength of this new force. Those who are interested in land purchase in Ireland, and in the work of forming new holdings and erecting new buildings upon them, will do well to refer to the reports of the Land Commission and of the Congested Districts Board.

But it is to the work of the Department of Agriculture that I wish specially to direct your attention to-night. This Department was established in 1900, the year following your last visit. It is not merely a Board of Agriculture in the sense in which that term is understood in Great Britain. In addition to agriculture, it is charged with the administration of that form of technical instruction which in England and Scotland is under the educational authorities. It also deals with fisheries and rural industries, besides having the care of various science and art institutions. In this respect it only differs from the English Board in that its responsibilities are more varied; while it resembles it in that the cost of its administration appears on the annual Parliamentary Estimates. One distinct point of difference between them lies in the fact that the Irish Department, in addition, has at its command an Endowment Fund which, however, can only be spent with the concurrence of its two Boards—one for agriculture and one for technical instruction. We are concerned for the present only with that side of the Department's work which deals with agriculture.

The sum annually available for the purposes of agriculture, rural industries, and fisheries (which was recently augmented by £19,000 for special work in congested districts, and by an indeterminate amount from the Development Fund), is £105,000, of which £78,000 represents the "whiskey money" given direct in your country to the County Councils, and £5,000 corresponds to the sum spent in Great Britain by the Royal Commission on Horse Breeding. This does not, however, comprise all that is spent on agriculture under the Department's immediate supervision. In addition, each of the thirty-three County Councils raises a voluntary rate (for the most part equal to 1d. in the £), which yields annually about £43,000, a very substantial portion of which is devoted to the Department's agricultural schemes. I would have you note these facts well, for we are constantly being told, and it is everywhere believed in Great Britain, that Ireland receives moneys for agricultural development which have no counterpart in grants to England or Scotland. But England, as well as Ireland, has her whiskey money and her horse-breeding fund, and if she does not see fit to supplement these by a direct rate, as Ireland does, that fact should not be overlooked when comparisons are made between the two countries. The root of the misunderstanding lies in the fact that whereas in England the whiskey money was handed over unconditionally to the County Councils, in Ireland it was given to the Department which

is responsible for its application, even when this is made through local authorities.

We may note here also an important provision of the Act creating the Department. It is that all our financial operations on behalf of agriculture must, as I have already indicated, receive the concurrence of an Agricultural Board of twelve members, eight of whom are chosen by representatives of the local authorities and the remainder nominated by the Department; while the whole policy of the Department, and of the Board itself, is subject to criticism by an Agricultural Council or Parliament of 103 members, two-thirds of whom, as in the case of the Board, are elected by the County Councils.

Turning now from these central authorities to local administrative machinery we see that each County Council appoints a County Committee for Agriculture and delegates to it the expenditure of the rate raised and of such sums as the Department places at its disposal. The rate and the Department's grant together form the county "joint fund" for agriculture, the whole being subject to the control of the Department. What you have to picture, therefore, is not thirty-three County Councils each formulating its own schemes and going along independent lines, as was done in Great Britain, but a systematic co-ordination and a uniform policy on lines laid down by the central authority. This policy you will find embodied in the documents which I have circulated. They take the form of a number of printed schemes prepared by the Department, and which, while uniform in the main principles, allow considerable latitude in regard to the adjustment of details to suit local conditions. Generally speaking, subjects in the benefits of which all ratepayers can equally participate are delegated to County Committees; while those institutions or undertakings which by their nature must serve the country as a unit, as also those applicable to restricted areas, are administered by the Department itself. As a matter of fact, of the £105,000 to which I have referred, between £50,000 and £60,000 is spent through County Committees and the remainder by the Department themselves.

It would be impossible in one lecture to give a comprehensive statement of what is being accomplished through each of these two branches of administration. Nor shall I attempt to do more than present a bird's-eye view of it. There is, however, one subject of special interest to our visitors to which I shall allude in passing, namely agricultural education. We are often asked how much of our funds and energy we devote to education. My answer is that the whole work of the agricultural branch of the Department is educational. Whether it is the provision of a scholarship in agriculture or a professorship in this College, the purchase of a high-class sire for a backward district, the sale of a plough or a harrow on easy terms where hitherto the spade only has been used, the introduction of seed potatoes where change of seed is not practised, the erection of a fence in the Donegal Highlands, or even the compulsory destruction of weeds—we regard each and all of our activities as a form of agricultural education suited to the needs of a particular class of the community.

I find it wholly impossible to separate our expenditure into that devoted to what is generally classed as technical instruction in agriculture and that which many regard as direct aid, so intimately are science and practice blended in all our operations.

I propose now to give you a brief sketch of these operations, and that I may not inflict upon you too great a mass of figures or words, I have thought it desirable to illustrate the work and its development as far as possible by means of lantern slides, beginning with a tabular statement of the classification used for administrative purposes. This classification is as follows :—

### SCHEMES ADMINISTERED THROUGH COUNTY COMMITTEES.

#### AGRICULTURE.

- Itinerant instruction.
- Field and feeding experiments.
- Winter schools.
- Farm and Cottage prizes.
- Seed, manure and feeding-stuff control.
- General advisory and inspectorial work.

#### HORTICULTURE AND BEE KEEPING.

- Itinerant instruction.
- Demonstration plots.
- Selection and distribution of fruit and forest trees.
- Bee Pest Act and Plant Disease Orders.
- General advisory and inspectorial work.

#### BUTTER MAKING.

- Classes.
- General advisory and inspectorial work.

#### POULTRY KEEPING.

- Itinerant instruction.
- Classes.
- Poultry stations.
- General advisory and inspectorial work.

#### HORSE BREEDING.

- Nomination of mares.

#### CATTLE BREEDING.

- Bull premiums.

#### SWINE BREEDING.

- Boar premiums.

#### SHEEP BREEDING.

- Sale of rams.

# GRANTS TO LOCAL SOCIETIES.

Agricultural shows.  
 Skilled labour competitions.  
 Industrial exhibitions.

## ADMINISTERED DIRECTLY BY THE DEPARTMENT.

### EDUCATIONAL INSTITUTIONS.

Royal College of Science.  
 Albert Agricultural College.

#### Farm Schools.

<i>Athenry</i>	<i>Ballycolman</i>
<i>Ballyhaise</i>	<i>Mount Bellew</i>
<i>Clonakilty</i>	

#### Forestry Schools.

<i>Dundrum</i>	<i>Avondale</i>
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#### Dairy and Poultry Schools for Girls

<i>Munster Institute</i>	<i>Ulster Dairy School</i>
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#### Schools of Rural Domestic Economy.

<i>Benada</i>	<i>Portumna</i>
<i>Claremorris</i>	<i>Ramsgrange</i>
<i>Clifden</i>	<i>Swinford</i>
<i>Loughglynn</i>	<i>Westport</i>
<i>Killeshandra</i>	

#### Special Schools.

<i>Cheese-making</i>	<i>Poultry Fattening</i>
<i>Flax</i>	

### HORSE BREEDING.

Purchase, re-sale, and registration of stallions.  
 Irish draught horse scheme.

### CATTLE BREEDING.

Selection and inspection of premium bulls.  
 Provision of stock bulls.  
 Irish dairy cattle improvement.  
 Cow-testing associations.

### CREAMERY IMPROVEMENT.

Visits of instructors.  
 Registration of creameries.  
 Courses for creamery managers.  
 Creamery managers' certificates.  
 Surprise butter inspections.  
 Cheese-making.

**FORESTRY.**

Purchase and development of lands.  
Advice to landowners.  
Restrictions on timber cutting.

**FRUIT GROWING.**

Fruit as a farm crop.  
Planting loans.  
Marketing.  
Shows and prizes.  
Nursery inspection.

**TOBACCO CULTIVATION.**

Instruction.  
Subsidies.

**FLAX INDUSTRY.**

Itinerant instruction.  
Field experiments.  
Continental visits.  
Improvement of scutch mills.  
Retting and scutching trials.  
Seed selection.

**PLANT BREEDING.**

Experiment station.  
Seed selection.  
Field trials.

**POTATO GROWING.**

Spraying.  
Boxing.  
Early potato culture.  
Seed trials.

**SEED TESTING AND PLANT DISEASES.**

Seed-testing station.  
Sampling.  
Trade supervision.  
Plant diseases.

**SUPPRESSION OF WEEDS.**

Inspection.  
Prosecutions.

**DESTRUCTIVE INSECTS AND PESTS ACTS.**

American gooseberry mildew.  
Black currant mite.  
Black scab in potatoes.

**ANALYTICAL STATION.**

Sampling manures and feeding stuffs.  
Analyses.  
Prosecutions.

**MARKETING OF PRODUCE.**

Work in Great Britain.  
Produce shows.  
Instruction in packing.  
Standard packages.

**SUPPRESSION OF FRAUDS.**

Detection.  
Prosecutions.

**LOAN SCHEMES.**

Credit societies	Scutch mills
Stallions	Meal mills
Bulls	Barns
Fencing	Agricultural implements
Village halls	Fruit trees

**SPECIAL INVESTIGATIONS.**

Dead meat trade	Veterinary hygiene.
Cattle feeding.	Implement trials.
Warble fly.	Sugar beet.

**CONGESTED DISTRICTS—SUPPLEMENTARY.**

Instruction in farm operations.  
Introduction of fresh seed.  
Demonstration plots.  
Sale of spraying machines and of agricultural implements.  
Live stock.  
Sale of forest and ornamental trees.  
Veterinary dispensaries.



## THE ELIMINATION OF THE UNPROFITABLE COW.

By PROFESSOR JAMES WILSON, M.A., B.Sc.  
(Royal College of Science for Ireland, Dublin.)

THE profits from cow-keeping depend upon three main factors, viz., cost of production, the yield of milk, and the price at which the milk or the product into which it is converted is sold. The first of these three factors works against the other two, and over all three the cow owner has a larger or smaller degree of control.

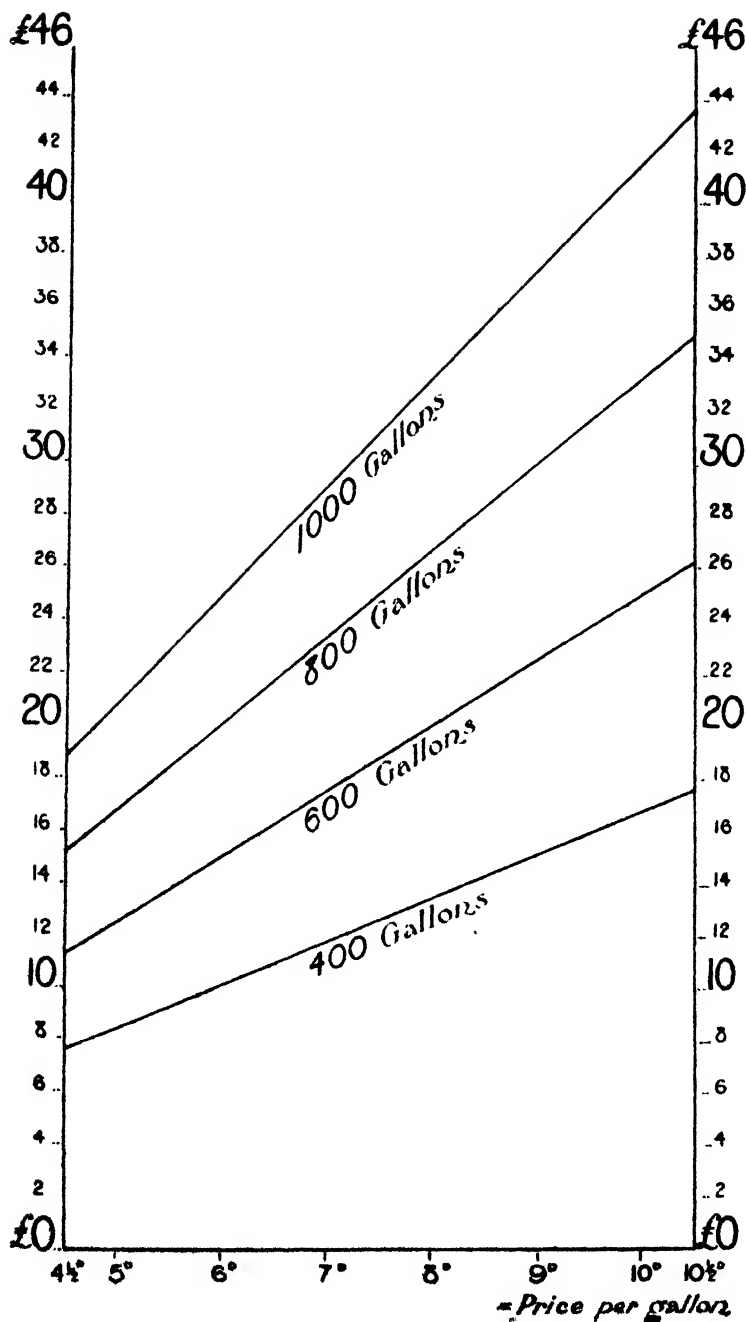
The cost of keeping a cow, when all outlays and incomes other than that from the milk are considered, varies under different circumstances between £8 or £10 at the one extreme, and £20 or £22 at the other. The normal yield of full-grown cows, *i.e.*, cows over five years old, varies between 400 or 500 and 1,000 or 1,100 gallons, and the return per gallon for 3·7 per cent. milk sold wholesale varies roughly between 4½d. and 10½d. The total return for a full-grown cow therefore may be as low as £7 10s. (400 gallons at 4½d.) and as high as £43 15s. (1,000 gallons at 10½d.).

When the three effective factors vary in this way, the profits from cow-keeping are bound to vary through an enormous range. When the two factors from which the income is compounded are at their highest, and the cost of production at its lowest, the profits are at a maximum, but when the conditions are reversed, that is, when cost of production is at its highest, and yield and price at their lowest, or even considerably above their lowest, a loss is sustained.

A consideration of the following simple diagram will indicate the possible variation in profits according as the three main factors concerned in their production themselves vary.

The money columns stand for both outlay and income. The slanting lines between them show the returns for four different yields at prices ranging from 4½d. to 10½d. If the yield of 400 gallons a year be taken, the slanting line shows its total annual value at all prices ranging between the two limits, *as, e.g.*, £7 10s. at 4½d., £10 at 6d., £15 at 9d., and £17 10s. at 10½d. If any figure be arrived at as the cost at which cows can be kept, a glance at the junctions of the money columns and the slanting lines will show which are the profitable and which the unprofitable cows. If £20 be the figure, then the diagram shows that even when the price of a 400-gallon cow's milk rises to 10½d. a gallon she is still kept at a loss. At the same figure (£20) a 600-gallon cow's milk must be sold at 8d. and an 800-gallon cow's milk at 6d. before either can begin to yield a profit. A 1,000-gallon cow leaves a slight profit when her milk is sold at 4½d. a gallon.

The three main factors which determine the profits in milk production are liable to control in varying degrees. The purpose of this paper is to deal specially with yield; but the operations of the two other factors may be referred to shortly. Take price first. It is



perhaps the factor whose effects in outlying districts are least open to expansion. By producing better butter and by greater skill in rearing young stock the return for a gallon of milk may be raised from 4½d. to 6d. or 6½d., but it cannot readily be raised farther. By greater skill in cheese-making and in the utilisation of its bye-product, the return from a gallon of milk may be raised from 5½d. to 7d. or 7½d. If a cow rear one calf by suckling, and if the calf, whose initial value is, say, £2 10s., be worth £10 at the end of the cow's lactation, the return for her milk is £7 10s. If the cow's capacity be 500 gallons, the return per gallon is 4d. If a second calf be reared and the milk be skilfully supplemented by feeding stuffs, the return of £7 10s. may be increased to £12—namely, £18 for the two calves less their initial value of £5 and about a £1 for feeding stuffs—and the return per gallon so raised to about 6d.

Thus the owners whose cows suckle their own calves only have no profit from cows unless they be kept at less than £7 10s. per annum. When a cow suckles two calves, her annual cost may rise to about £12 before she becomes a source of loss. The less skilful producer of butter must keep his 500-gallon cows at just under £8, otherwise he loses. The more skilful producer can afford to stretch to about £12. The skilful cheese-maker can afford to stretch to about £15 before he begins to lose. But in all three cases, profits, when they do exist, are dependent upon cutting down rather than increasing the outlay—upon what is usually the last resort rather than the first in an enterprising business concern.

The cost of keeping a cow varies greatly and is too often unnecessarily high. The data collected by the late Mr. Speir and Dr. Crowther show great variations in the cost of keeping cows of similar capacity. There must therefore be great waste in the cases of those fed most expensively. This kind of waste is perhaps greatest in herds from which fresh milk is sold, and the price of the product being usually high enough to bring a good profit, the unnecessary expenditure is not even suspected. Feeding experiments in milk production indicate that, for full-grown cows, the essentials are quantity and succulence; and the cow's digestive capacity being as it is, concentrated feeding stuffs in large quantity are not a necessity and do not increase the milk flow proportionately to their cost.

Unfortunately as yet we have no experiments to show the proportions in which long fodder, roots and concentrates should be given in order to produce the maximum yield at the minimum expenditure. The point at which the money returns begin to diminish has not been found with regard to any single selling value. Indeed, it might be said that as yet we have no reliable experiment in feeding for milk yield; for no experiment has been carried out in which one ration has been tried against another upon cows even approximately alike, that is upon cows alike in yielding capacity, in age, in "condition" before calving, similarly advanced in lactation, and similarly advanced in their next pregnancy.

The value of milk and the cost of its production being as they are, it is vitally important, in the interests of butter and cheese producers and rearers of calves, that the low-yielding cow should be eliminated: that she should not be bred. To what has already been said it might be added that butter producers and calf rearers in addition to having many low-yielding cows in their possession, are most frequently saddled with the rearing of young stock and with the keeping of cows till they have reached their full productive powers. Thus the need for the elimination of the low-yielding cow, in the interests of the cow owner in districts far removed from a dense human population, becomes intensified beyond what has been indicated earlier in this paper.

But what is the unprofitable cow? She is not the same under all circumstances. The man who can keep a cow at about £8 can make poor butter or rear calves and still get some profit, perhaps, from a 400-gallon cow. The man who cannot keep her under £20 may lose even with a 1,000-gallon cow. Thus the question is one to which different answers can be given, depending upon the cost of production and the price at which the product is sold. Yet although this question is unanswerable in a general way, the problem of the elimination of the unprofitable cow is capable of a general solution. We have merely to find which is the unprofitable cow for the least favoured producer and consider how she may be eliminated. If we do this the problem is solved for all.

If we look back at the diagram we see that the less favoured producer is not in a satisfactory position with a cow giving less than about 600 gallons. Our aim is therefore to eliminate all cows of a less capacity than 600 gallons. We shall see, however, that our only safety lies in aiming to breed only cows whose capacity at full age is nearer 1,000 gallons.

Most Shorthorn breeders now know how the production of white calves may be avoided. The observations upon which they rely are these:—

Two white parents leave only	..	White calves.
Two red parents leave only	..	Red calves.
A white parent and a red leave only	..	Roan calves.
A white parent and a roan leave	..	White and roan calves.
A red parent and a roan leave	..	Red and roan calves.
Two roan parents leave	.. ..	White, red, and roan calves.

If these statements be looked into it will be seen that when one parent is red, no white calves are produced, and that when both parents are red, only red calves are produced.

The manner in which milk yield is inherited is parallel to that in which Shorthorn colours are inherited. There are three grades of yield in full-sized cows, viz., approximately 1,000, 750, and 500 gallons. It must be remembered that these figures are approximate only. In each grade there are subvariations whose causes we cannot even guess at as yet.

Two 1,000-gallon parents produce..	1,000-gallon progeny.
Two 500-gallon parents produce ..	500-gallon progeny.
Two 1,000 and 500 gallon parents	750-gallon progeny.
produce .. .. .	
Two 1,000 and 750 gallon parents	1,000 and 750
produce .. .. .	gallon progeny.
Two 500 and 750 gallon parents	750 and 500
produce .. .. .	gallon progeny.
Two 750 gallon parents produce ..	1,000, 750, and 500
	gallon progeny.

If these figures be looked into it will be seen that if one parent be of the 1,000-gallon standard, no 500-gallon progeny will be produced. If both be of the 1,000-gallon standard, only 1,000-gallon progeny are produced. Thus we have merely to follow the example of the Shorthorn breeders in avoiding the production of white calves.

There is the difficulty that the 1,000-gallon bull cannot be identified till his daughters come in profit. When such a bull is identified, however, his value cannot be estimated, for he and his stock can be used in the production of an indefinite number like himself. Meantime our surest means of achieving our final aim is that no sire should go into service unless his dam be of the 1,000-gallon standard. Thus no sire below the 750-gallon standard goes into service.

We must avoid being diverted by "pedigree," as 1,000-gallon cows, just like 500-gallon cows, are found in all strains—in "beef" strains as well as in "milk" strains.

There is only one other point. All cows that are called 1,000-gallon cows are not such. The arithmetic sometimes needs revision. If a cow be not in calf again at the usual time, her yield is increased thereby. A month's delay may add more than 100 gallons to a good cow. Three months may add 300 gallons. The surest test of a cow's capacity is her yield at the flush a few weeks after calving. It has been found that if this be multiplied by about 200 the product represents approximately the total yield for the normal lactation period. Our aim therefore should be to put no sire into service whose dam gives less than about 50 pounds of milk at the flush when she is of full age. The corresponding figures for heifers and four-year-old cows are slightly over 30 and 40 pounds.

[It has to be stated that an American worker suggests that the inheritance of yield depends entirely upon the bull. The data collected on this side do not exclude this suggestion entirely, although they do not support it. But either way, everything depends upon the sire being the son of a 1,000-gallon cow.]

## CO-OPERATIVE DAIRYING IN IRELAND.

By R. A. ANDERSON, Secretary. Irish Agricultural Organisation Society.

You honoured me fourteen years ago with an invitation to read you a paper on this subject, and I accepted the invitation with a good deal of trepidation. I prepared a paper to be read at the Sligo session of your Association, but circumstances prevented me from reading it at your meeting, and deprived me of the opportunity of thanking your members for their sympathetic attitude towards a movement which was in those days little understood, and had little to show, and certainly little to teach British dairy farmers. It is extremely gratifying to me to be again invited to report to your Association the progress that has been made since that time in developing the Irish dairying industry on co-operative lines. I hope that what I have to tell you to-day may satisfy you that Ireland has advanced satisfactorily along the lines which I explained to you in 1899, and is gradually perfecting the organisation of her dairying business in such a manner as to enable her farmers to hold their own in competition with dairy farmers of other countries. It would be sheer affectation on my part if I did not claim for the I.A.O.S. the lion's share of the credit for the progress that has been made. The fact is not denied. Even our opponents admit that we have been the most powerful agency in transforming the ancient home industry of butter-making into a factory industry—a transformation called for by the trade, which demands a degree of uniformity and excellence of quality which can only be attained by the adoption of scientific methods and the employment of the newest appliances.

The aim of the I.A.O.S. is to convince Irish dairy farmers that the success of their industry must depend upon their ability to produce an article which can hold its own against the products of other countries; to strive to attain to uniform excellence in their butter; to ascertain what you in Great Britain require and to give you what you ask for. We in the I.A.O.S. place no reliance upon sentiment as far as our customers are concerned, but as sentiment enters largely into almost everything we do in Ireland, we appeal to the members of our co-operative creameries, one and all, to do their part in upholding the ancient reputation of the island as a butter-making country. We do not appeal in vain, and as a result of our labours we find our Societies almost always ready to provide the funds necessary to perfect the equipment of their creameries so as to enable them to turn out a product which will satisfy the taste of the British consumer, for whom the whole civilised world is catering. It is for you to say how far these efforts have been successful, to tell us frankly in what respects we fall short of our competitors, and to indicate to us the lines upon which we should go if we are to attain to the premier position.

The most recent returns of Irish exports show that in 1911 Ireland exported 688,362 cwt. of butter, valued at £3,671,264, by no means an inconsiderable item in the agricultural production of the country. These figures do not include the very large volume of business which is being done through the medium of the parcel post, nor do they include what is required to meet the rapidly increasing home consumption of creamery butter. The item of £3,671,264, the value of butter actually exported in wholesale trade, is what you are chiefly concerned and interested in. It bulks largely in our statistics, and, as I hope to show, it may be capable of great increase.

As British taxpayers, I submit that, quite apart from any questions of sentiment, you are deeply interested in this development. You have already pledged your credit for upwards of £100,000,000 for Irish land purchase, and before you have completed the scheme under which the ownership of all the agricultural land in Ireland will be transferred from the landlord to the tenant farmer, you will probably have to pledge your credit for £100,000,000 more. Your sole security for the interest upon and redemption of this huge sum is the ability of the Irish tenant farmer who has bought his holding to meet his obligations to the State—that is, *to you*. The punctuality with which the newly installed peasant proprietors in Ireland have met their obligations under the Land Purchase Acts has been remarkable and encouraging; but it must not be forgotten that we have enjoyed a period of prosperity ever since land purchase became an accomplished fact, and that this period may not continue. I therefore put it to the members of your Association, as business men and as partners in a huge business transaction, in the success of which they are heavily involved, that enlightened self-interest should dictate to them the necessity for encouraging by every means in their power the development and improvement of an industry which concerns vitally so large a proportion of the Irish farming class. We in Ireland do not lay claim to any special wisdom in Imperial matters, but we cannot shut our eyes to the fact that any day an international complication may arise which would cut off from British markets more than one of its main sources of supply of dairy produce, and force you to look to us for your supplies. We cannot be entirely self-supporting, but the more food we can produce within our own shores, the better for our farmers and the better for your teeming millions. Now we do not at present produce as much of any article of food, except perhaps milk, as would suffice to supply the daily needs of the United Kingdom; but unless I am much mistaken, we can increase our agricultural production in a marked degree if we will only follow out a very simple programme. It is “right here,” as our American cousins say, that your Association can help us, and by so doing materially improve your own position. You must tell us what you want, and how and when you want it. We ask for no favours from you further than you shall criticise our products and our business methods in a friendly spirit, and point out to what extent we fall short of the standards of our competitors. We are not a stupid people by any means—many of you may have discovered that for yourselves—

but we have no desire to be regarded by you as being too "cute" to do business with on satisfactory lines. We have very great natural advantages of which we have not as yet availed ourselves to the utmost, and there is now aroused in Ireland the desire to get into your markets—not at the bottom, as formerly, but right up at the top. We want to capture your high-class trade by sending you of our best. If we achieve that feat, we need not grudge the lower places to our competitors.

You may ask me, what we are doing to meet the requirements of British trade, and what precisely it is that we want you to do on your side. I will try and answer both questions.

Fourteen years ago, when you were good enough to discuss the paper I offered you, I told you that there were but 181 co-operative creameries in Ireland, turning out butter to the annual value of £750,000. The latest published report of the I.A.O.S. (a copy of which will be supplied to any member of your Association who desires to study it) shows that the number has increased to 413, with a trade turnover for 1911 of over £2,000,000, a membership of 45,725, and a capital of £257,553. When it is remembered that every penny of this capital has been found by the co-operating farmers, without any outside financial assistance, and that with very little assistance and advice these men, mostly uneducated in business transactions on a commercial scale, have built up this huge business in competition with the whole world, I think it will be conceded that Ireland has no reason to be ashamed of itself. You will visit some of these creameries, and you will be able to judge how they compare with similar institutions abroad. In criticising them you will remember that they are, for the most part, institutions created by poor men. They are in no sense "show places." They are designed to give the best results at the lowest capital expenditure, and are all worked to return the best price to their members for their milk. But your criticism is invited and will be welcomed. We recognise its value to us commercially, and we will appreciate it as it comes, friendly or unfriendly. Only, *let it come*. If I might offer one word of advice to men who are experts in these things it would be this: Don't look for glazed tiles, for copper or white metal piping, for immaculate floors, or for men (and pretty girls) "clothed in white raiment." You will see *some* pretty girls, I hope, but you will find in every co-operative creamery you visit, if not perfection, at all events an earnest and honest desire to do honest work, to do something for Ireland. You will, as practical men, judge our creameries by their butter. I think you will find it all right.

We in the I.A.O.S. are eternally dinning into the ears of our Creamery Committees and staffs that mediocrity in anything means stagnation and dry rot. We find a very welcome response to our call, and three years ago we were able to get a considerable number of the co-operative creameries to join in a scheme which was designed to level up the quality of their butter and to protect its sale on the British markets. We call this scheme the "Irish Co-operative Creamery Butter Control." It is largely modelled on the lines of the "Boter



Kontrol" in Holland, but, so far, has not received any official benediction. The full details of the scheme will be supplied to any member of your Association who may desire to study the matter; but I will here give the main features as briefly as possible.

The aim is to secure the adoption in certain selected creameries of a system of manufacture which will produce butter of the best quality, to ensure the sale of this butter under a registered brand and to trace to its source any package of butter sold under the Control brand which does not come up to the required standard of excellence. The conditions of participation in the scheme were laid down by the creameries themselves, and are sufficiently onerous. The I.A.O.S. was appointed arbiter in the matter, and its decision as to the admission or rejection of the applicant creameries is final. In the first instance, the building and equipment of the creamery must be approved by the I.A.O.S. expert; next, the management and system of working must be approved before admission can be secured. Very high standards were set by the meetings of creamery representatives who drafted the regulations governing the Control. Every creamery joining the scheme had to satisfy the I.A.O.S. as to the efficiency of its management, to agree to pasteurise its milk or cream, to maintain a condition of absolute cleanliness, to ripen its cream by means of pure culture before churning, to guarantee that the percentage of moisture in the butter produced did not exceed 16, to send bi-monthly samples of its butter for bacteriological analysis, to retain samples of every churning for inspection, to make periodical returns of its trade, to affix to every package a label bearing the trade mark of the Control, and to keep records of every transaction in such a manner as to enable any package to be traced back to its original source. For the privilege of participating in the scheme every society is obliged to be affiliated to the I.A.O.S., and to pay a toll of at least one penny per cwt. on all butter sold. The advantages of such a scheme to the buyer can scarcely be over-estimated, and they are too obvious to be laboured. The participating creameries have realised better prices and enjoy more satisfactory relations with their customers. It is hoped that this scheme will prove so attractive to the creameries that before long all will be participants in it. The ultimate object is to secure for those creameries who take part in it the right to sell their products under a trade mark which will command the respect of all buyers of Irish dairy produce and, it is hoped, a special price.

It must not be inferred from this that any attempt is being made by the I.A.O.S. to increase prices to the consumer. The object of the Society has always been to organise farmers to produce more economically, and so enable them to sell more cheaply. But to anybody in trade it must be clear that the value of any article produced and sold under such conditions, and vouched for by a trade mark, will unquestionably be enhanced.

The production of butter in Ireland, quite apart from the large question of the introduction and extension of winter dairying, is capable of very great development. It is estimated that our cows

produce, on an average, about 450 gallons of milk per annum. The Danish cow produces almost twice as much, but she is simply a milk-producing machine, because the Danes have little or no interest in the beef-producing industry. That consideration cannot be ignored in Ireland, where the cattle trade is by far the biggest item in our trade export statistics. We cannot afford to breed for milk production only and substitute such a breed as the Ayrshire for our Shorthorns. But there are many strains of the Shorthorn which have developed milk production to a high degree, and experience has shown that this quality of milk production is hereditary. Therefore, the I.A.O.S. has advocated the formation of cow-testing societies in connection with the co-operative creameries, and with some very striking results. The methods employed are very simple: the volume of milk given by each cow is ascertained by weight, and the percentage of butter-fat is determined by test, the weight of the milk and the percentage of fats which it contains being recorded. The unprofitable milkers are ascertained and weeded out and the profitable ones retained. It is believed that by this process the average milk-producing capacity of the dairy cow could be increased in a very short time to 600 gallons per annum without more than a trifling cost to the farmer, and the productivity of his dairy herd increased by 33 per cent. without in any degree impairing the beef-producing qualities of the animal. The I.A.O.S. holds strongly to the opinion that this development of the dairying industry ought to be carried out in connection with the co-operative creameries where the facilities for testing the milk exist, and that it should not be relegated to any public department where it would become a charge on the taxpayer for the benefit of the farmer, who ought, in his own interest, to have the milk-producing capacities of his cows properly tested. As an instance of the value of such a test, I may mention that I was recently informed by a farmer, who had kept such a check on the produce of his dairy herd, that he found one cow's milk worth £12 at the local creamery and another's worth only £5. The £5 cow was promptly "scrapped." Without that test, this man might have gone on for years milking his £5 cow and breeding worthless milkers from her. I am convinced that, great as was the advance of the creamery over the old-fashioned home butter-making system, the results to be attained from a system of cow-keeping associations will be even greater and more valuable. Indeed, I see no reason why the export of butter from Ireland should not be increased double the present figures, or even more.

Winter dairying is such a big question that I almost hesitate to mention it in a paper already, I fear, too long. But it must be obvious to every thinking dairy farmer that no system of dairying is complete which does not aim at all-the-year-round production. We cannot expect retailers of butter to push the sale of a season's product unless they are well rewarded for doing so. The butter trade is a pretty close cut trade, and a retailer has no margin to enable him to give preference to Irish creameries, unless Irish dairy farmers are prepared to supply him, week in, week out, with what his customers demand.

Winter dairying has made but little headway in Ireland since I last placed this subject before you. But in a few cases it has been energetically promoted, and I think its general adoption is merely a matter of time. To make it successful it will be necessary to effect little short of a revolution in our farming methods. Our farmers will have to take to tillage, and must be instructed and induced to till intelligently. We are faced with a very complicated labour problem in Ireland, and the production of suitable crops for the winter feeding of cows can only be rendered economically possible by the use of the most up-to-date labour saving appliances. We have got to show the farmer that winter dairying is essential, and we have to demonstrate that it will pay. Winter dairying will make it quite possible to increase our butter producing area very considerably. At present dairying in Ireland is mainly confined to those parts where the cows are mainly fed upon grass.

Nothing, in my opinion, would be so well calculated to increase the prosperity of the country as the extension of dairying to tillage districts, and to those where store cattle are now fed. There is a belief that the rich grazing lands of Meath and Kildare are unsuitable to butter production, and that these pastures are better calculated to fatten the animal than to fill the pail. Some day the experiment may be made, for there is an increasing number of intelligent men who hold strongly to the opinion that the future prosperity of Ireland lies rather in the production of butter, bacon, eggs, and poultry than either in raising of store cattle or the production of beef. The extension of dairying would be followed by a great increase in pig rearing and feeding and poultry keeping, for these two industries are the necessary concomitants of the former. In this development lies the solution of the agricultural labour problem in Ireland, and in it will be found the truest and best source of prosperity of the farming industry. We agricultural organisers are trying to bring it about in the firm belief that the well-being of the three kingdoms can be best assured by the reconstruction of the most ancient industry on economic lines.

# THE IRISH DAIRYING INDUSTRY.

By A. POOLE WILSON, Department of Agriculture and  
Technical Instruction for Ireland.

I PROPOSE to examine the progress of Irish Dairying since the last visit of the British Dairy Farmers' Association to Ireland in the year 1899, when the members visited the west and north of Ireland. Progress may be treated under the following heads:—

- (1) Educational facilities.
- (2) Creameries.
- (3) Output.
- (4) Quality.
- (5) Buildings and equipment.
- (6) Commercial aspects.
- (7) Other branches of dairying.
- (8) Milk production.

## I.—EDUCATIONAL FACILITIES.

In 1899, before the formation of the Department, the educational facilities for those engaged in the dairying industry were provided by the Commissioners of National Education and were as follows:—

Two sessions, each of six weeks' duration, at the Glasnevin Dairy School, and three sessions, each lasting six weeks, at the Munster Institute in Cork. About 200 women annually received a training in butter-making at these sessions. In addition there were three itinerant instructresses at work holding at suitable centres classes for farmers' daughters.

Two courses, each of six weeks' duration, were held annually for those intending to take up the work of creamery management, one at the Glasnevin Dairy School and the other at the Munster Institute. Twenty to thirty young men were trained annually.

Further, there were two itinerant instructors who visited creameries throughout the year, and gave technical instruction in all matters connected with the management of such places.

In 1900 the Department of Agriculture and Technical Instruction was formed and the educational facilities have been improved and may now be summarised as follows:—

The Department's scheme (No. 15) for encouraging improvement in the management of creameries has been handed to you. It will be noticed that there are eight instructors in dairying, each in charge of a district.

The scheme is a voluntary scheme and is largely availed of by the owners and managers of co-operative, joint-stock, and proprietary concerns. The duty of the instructor in dairying is to promote the manufacture of the highest quality of dairy produce, to see that it is properly packed, to see that the highest yields are obtained consistent with the quality of the milk used, to see that the marketing or salesmanship is improved, and that the costs of production are brought to the lowest figure compatible with the work to be done.

The demands for the instructors' advice are becoming heavier each year as proprietors and managers realise more and more the value of the instructors' services. A visit is made by the instructor at least once a quarter to all the creameries in his district, but he visits more frequently those in greatest need of advice. The work is not inspection but instruction. On arrival at a creamery the instructor examines the milk in course of delivery and the vessels. Suppliers' pass-books are stamped with suitable observations as the occasion calls for, such as: "Cloths should not be used," "Milk cans and lids require thorough cleaning, scalding, and airing every day," "All milk should be properly strained"; and where the milk and cans are both clean, a special stamp of approbation is used: "Milk and cans delivered in good condition"; so that, besides pointing out defects, commendation is given when it is deserved.

This work of criticism is not the most pleasant part of an instructor's duty, and calls for a great deal of patience and tact. However, the result has been a decided improvement in the quality of the milk at the places where the proprietors and managers support the efforts of the instructor by keeping up the pressure between his visits.

The instructor then examines the condition of the premises and plant, observes the technical methods, examines the books, &c., gives instruction as necessary, and at the close of his visit embodies his observations in a report written in a book which is kept at the creamery.

Incidentally the instructor may have to prepare plans or specifications for machinery. However, the aim is to do the best with what the creamery has, and then, as the financial position improves, to advise the installation of more economical or labour-saving plant. One has always to bear in mind that machinery does not make the butter good, but makes it more economically, and that cleanliness is the key to success in all dairying. While unpleasant truths have to be stated when matters are not all they should be, the relationship between our instructors and the proprietors and managers is of the best, and it is being realised more and more that the instructors are not fault-finders, but teachers, who are only doing their duty by the creamery and their country in endeavouring to improve the quality of the dairy produce.

At present there are about 400 creameries and cream-separating stations visited by the instructors out of about 750 in Ireland, 2,182

visits having been made during the year ending 30th September, 1912. Presuming that the conditions laid down are complied with, the creamery is placed on an approved list which is revised and published periodically.

*Surprise Butter Inspections.* A series of "Surprise Butter Inspections" has been arranged by the Department. All creameries on the approved list and none others send butter to these inspections. The examination of the butter, after storage for a week or ten days, reveals any latent defects which are not always capable of being detected at the creamery. It is then the duty of the instructors to seek the reasons for the defects and show the maker how the faults may be avoided. Provision is made by the Department for selected groups of managers and dairymaids to attend the inspections.

As pointed out in the first scheme issued, the object of these inspections is to induce creamery managers and others engaged in butter-making to give increased attention to every detail in the making and packing of butter, and particularly to cleanliness in and around the farm dairy and creamery. The reputation of Irish butter must depend on the degree in which these two qualities, viz., cleanliness and attention to details, are possessed by Irish butter-makers. But unless those engaged in the industry bring into the work a certain amount of enthusiasm, accompanied by a desire and a determination to excel, the qualities which mark the successful butter-maker will not be developed and the possibilities of Ireland as a butter producer cannot be realised to the full. Fortunately butter-making is an occupation which becomes engrossingly interesting to those who have studied the numerous scientific problems which it presents to the thinking mind.

Some of your members have already attended the premises at which the surprise inspections are held, and the procedure has been explained to you.

It will also be noted that local surprise butter inspections are encouraged, and two associations have conducted these very successfully. The local inspections have been of great service, as all those connected with the manufacture of the butter at any of the creameries can easily attend—proprietors, managers, and butter-makers. Two very good features introduced are the seizure of the butter without warning by some one appointed by the Association for that purpose, and the holding of judging competitions amongst the managers and butter-makers.

It is also a general practice at these local inspections for the judge to remain to meet the competitors, and justify his scoring, a practice which I think is to be recommended for its educational value both to exhibitors and judges. All the exhibits can be examined and thus the inspections have an educational value which the ordinary show has not, since the use of wire netting prevents exhibits being examined, and there is no opportunity of discussion with judges and makers.

*Courses of Instructions.* A winter course of instruction of five months is held at the Ballyhaise Agricultural Station. The Department have utilised a creamery in proximity to the station, more especially for illustrating the engineering and accountancy portion of the course. It will be noted from the scheme that managers are encouraged to attend by the offer of free places, while the promising apprentices are afforded, at the Department's expense, six months' practical instruction in selected creameries.

In addition, short courses of instruction for existing for creamery managers and butter-makers are held at selected local centres, under the auspices of local associations or the local branch of the Irish Creamery Managers' Association. The Department supplies the teachers and contributes to the cost of holding the courses.

In this way provision is made for the man who is entering on a course of training, and for those who were unable to obtain the necessary technical training in the early days of the movement, or who desire to have their knowledge "brushed up." During the winter of 1912-13 local classes were held at six centres for managers and at one centre for butter-makers; a total of 120 attended. Finally, there are scholarships at the Royal College of Science for those who decide to pursue a higher course of training in the subjects relating to the management of creameries.

Special attention is given at all the courses to the commercial side of the work, such as "economic production" and "salesmanship," subjects which are rather apt to be neglected at the present time in many dairy schools. The aim is not only to train men to make dairy produce of the highest quality, but to make it economically and sell it well. A summer course of training in cheese-making is provided for men at Ballyhaise.

Two classes of certificates are awarded: First, one of having passed the examination in technical subjects as applied to creamery management. This is the theoretical side. The certificate is given on the result of a written and oral examination. The second certifies that the holder, in addition to having the technical knowledge, has managed a creamery to the satisfaction of the Department.

Special facilities are also offered for the training of dairymaids in creamery work. This is necessary as the handling of half a ton or more of butter per day is a very different matter from making a few pounds on a farm. Instruction is given in the estimation of water in butter, use of acidity test, pasteurising test, calculation of yields, all of which come within the daily duty of a skilled dairymaid in a large creamery.

*Home Butter-making.* For home butter-makers there are two institutions under the Department's management—the Munster Institute at Cork, and the Ulster Dairy School in County Tyrone. These are residential institutions open to girl pupils from all parts of the country.

In addition there are nine smaller institutions where resident or day girl pupils are taught dairying amongst other subjects. These

schools are intended chiefly for girls living in their immediate neighbourhood. Their aim is mainly to provide training in the work of a farmer's home.

The Munster and Ulster schools provide in addition advanced courses to enable pupils to qualify as (a) dairymaids in creameries or large dairies, (b) county instructresses in dairying and poultry-keeping, and (c) teachers in agricultural schools for girls.

The total attendance at the four terms of the Munster Institute during the year 1911-12 amounted to 224 pupils, including re-admissions. At the end of the year there were nearly 200 applicants awaiting their turn for admission. At the four terms held at the Ulster Dairy School, 190 students attended, including re-admissions, and the applications for admission amounted to 169.

Eighteen students of these schools, who completed the third term courses, were offered by the Department a free training of 20 weeks in approved creameries.

There are employed by the County Committees of Agriculture 33 itinerant instructresses in butter-making, who, during the year 1911-12, gave 191 lectures attended by about 3,000 persons, conducted 224 classes with about 1,800 pupils, and paid 7,500 visits to home dairies. The Department's scheme No. 13 explains fully this part of the work.

A training in Caerphilly and Cheddar cheese-making, covering eight months, is provided by the Department. Eight girls have so far been trained, seven of whom are in employment, and four more are undergoing training at present.

The training of cheese-makers includes the commercial side of their work, such as the dimensions of the buildings required, utensils necessary, their approximate cost, costs of manufacture, yields from milk of varying quality, marketing, &c., so that at the end of the course the pupil should be able to put before a prospective manufacturer all the factors which it is necessary for him to know in order to determine what are the financial possibilities before him. This is absolutely necessary when you are introducing an industry, and would be of advantage to many of the older makers. I have been greatly struck by the absence of accurate information on this point in Great Britain.

## II.—CREAMERIES.

Of Irish butter, that made in creameries brings the highest average price, consequently any increase in the number of creameries is a measure of progress.

There being no compulsory notification of the erection of creameries or cream separating stations, it is a matter of difficulty to obtain accurate figures, and the following is an approximation only :

	1897.	1900.	1907.	1913.
No. of creameries and cream- separating stations ... }	333	536	780	750



There was an increase up to the year 1906; since then a number have been closed or amalgamated; three large companies have practically withdrawn from the creamery business, viz., the Maypole Dairy Company, J. & J. Lonsdale & Co., and the Co-operative Wholesale Society. This does not necessarily imply a shrinkage in the amount of butter made in creameries. For example, the small town of Charleville used to have three proprietary concerns, whereas it has now only one co-operative creamery dealing with all the whole milk of the district.

### III.—OUTPUT.

If we examine the statistics of Irish exports of dairy produce, the collection of which was commenced in 1904, we find a rather curious state of things which might mislead an outsider not acquainted with the butter trade of this country.

TABLE I.  
EXPORTS.

Year.	Butter.	Cheese.	Condensed Milk.	Milk and Separated Milk.	Cream.	Casein and Milk Powder.
	Cwts.	Cwts.	Cwts.	Cwts.	Cwts.	
1904 ...	815,783	1,142	252,745	**19,019		
1905 ...	813,921	921	291,358	10,019		
1906 ...	844,027	1,222	176,660	17,296		
1907 ...	818,004	2,460	290,183	5,418	6,058	
1908 ...	751,942	3,231	283,829	19,425	3,864	
1909 ...	719,625	4,015	274,842	1,605	10,351	
1910 ...	698,907	3,365	292,346	5,836	13,809	
1911 ...	688,362	6,031*	254,560	7,164	15,162	
1912 ...	—	5,000	—	—	—	5,000
		(Estimate)				(Estimate)

\* Probably includes some Casein and Dried Milk.

\*\* Milk, Separated Milk, and Cream were bulked together in returns till 1907.

It must be remembered, however, that the erection of creameries does not always imply a new source of milk nor a consequent increase in the output of butter; it merely represents a change in the method of manufacture.

The decrease in the recorded exports of butter has been attributed to the following:—

- (1) An increase in home consumption.
- (2) The development of the parcel post trade.
- (3) The increase in the railway parcels traffic.
- (4) The export or slaughter of the best dairy cows.
- (5) Absence of winter dairying.
- (6) The use of bulls of beef strain.
- (7) The spread of abortion.

That there is an increase in the number of milch cows in the country the following table shows :—

	No. of Milch Cows and Heifers-in-calf.					
1899	...	...	...	...	...	1,443,585
1910	...	...	...	...	...	1,557,584
1911	...	...	...	...	...	1,565,418
1912	...	...	...	...	...	1,598,986

There should accordingly be more milk. The question is, where has it gone ?

On examining the export figures, the cattle exported have also increased : —

	No		Value	
1905	...	749,934	...	£8,928,253
1906	...	776,281	...	9,146,915
1907	...	843,010	...	10,419,430
1908	...	862,634	...	10,935,197
1909	...	838,383	...	10,751,550
1910	...	869,181	...	11,454,285
1911	...	695,529	...	9,566,393

Excluding 1911, when the shrinkage is mainly attributed to drought, there is a big increase in the exports of cattle, indicating that more calves are being reared, utilising more milk and leaving less for butter. Further, owing to the influence of the Department's teaching calves are now better reared and get more milk than formerly. Again, the standard of living has very much improved, and more milk and butter are consumed at home. This fact is also proved by the increase in the imports of butter, mainly during the winter months, when there is a shortage of Irish butter.

TABLE II.

IMPORTS.

Year.					Butter.	Cheese.
					Cwts.	Cwts.
1904	...	...	...	...	59,053	42,707
1905	...	...	...	...	57,438	41,422
1906	...	...	...	...	60,194	40,906
1907	...	...	...	...	63,258	44,445
1908	...	...	...	...	62,918	36,150
1909	...	...	...	...	68,347	42,611
1910	...	...	...	...	77,945	43,560
1911	...	...	...	...	88,472	46,573

TABLE III.

TABLE SHOWING THE QUANTITY OF BUTTER IMPORTED INTO IRELAND DURING EACH MONTH OF THE YEARS 1909, 1910 AND 1911.

Month.	1909.	1910.	1911.
	Cwts.	Cwts.	Cwts.
January ... ..	12,719	16,483	18,840
February ... ..	14,096	16,036	18,209
March ... ..	13,670	15,096	17,369
April ... ..	7,759	9,723	10,004
May ... ..	3,965	4,214	5,536
June ... ..	1,309	1,262	1,839
July ... ..	700	858	756
August ... ..	1,136	868	1,045
September ... ..	737	1,038	3,115
October ... ..	716	936	2,122
November ... ..	2,275	1,832	2,915
December ... ..	9,265	9,599	6,711
Total ... ..	68,347	77,945	88,472

During the last few years there has been undoubtedly an enormous increase in the parcel post and passenger train traffic in butter, both from private dairies and from creameries. This quantity cannot, at present, be determined and is not included in the export figures.

The sale out of the country of the best dairy cows has been going on for a number of years, and has slightly increased during the last few years.

The extent of the slaughter of good milch cows after concluding a year in a town dairy is not known.

There is a slight tendency to an increase in the amount of milk produced during the winter months. Creameries which formerly closed down during the months of January, February and March, are now remaining open during that period.

The change is not, however, sufficiently great to influence the returns obtained by the instructors, as the following table will show :-

THE AVERAGE PERCENTAGE OUTPUT PER MONTH FROM A NUMBER OF CREAMERIES FOR THE LAST FIVE YEARS.

Year.	1906.	1907.	1908.	1909.	1910.	1911.
No. of Creameries.	—	48.	40.	63.	114.	110.
Month.						
January ... ..	1.70	1.84	1.80	2.22	1.93	1.81
February ... ..	1.60	1.40	1.55	1.97	1.68	1.53
March ... ..	3.30	2.42	2.89	3.31	2.63	2.61
April ... ..	5.30	4.88	5.41	5.61	4.98	4.52
May ... ..	12.30	10.25	11.42	11.02	9.97	10.41
June ... ..	15.40	15.10	15.81	15.35	15.54	15.63
July ... ..	15.10	15.51	16.00	16.00	16.05	15.25
August ... ..	13.60	15.46	14.46	14.00	14.69	14.46
September ... ..	12.20	12.70	11.58	12.40	12.15	13.36
October ... ..	10.10	10.46	9.58	9.20	10.48	10.20
November ... ..	6.00	6.78	6.41	5.78	6.54	6.43
December ... ..	3.40	3.25	3.09	3.14	3.21	3.72

The principal factors retarding the growth of winter dairying are the existence of cows giving less than 600 gallons of milk per annum, and the system of paying more than the milk is worth in the spring and summer months, and making up the loss by paying less than the value of the milk in the autumn and winter months. The latter is partly the fault of the owners of creameries who, in early days, overpaid in the spring in order to obtain customers, and then trusted to the suppliers remaining on to making a profit later in the season. In the case of co-operative creameries, the committees are pressed to pay the highest price possible when the supply of milk is at its maximum. Further, the costs of manufacture are not properly allocated, the "fixed charges" debited against the output of each month being too low when supplies of milk are high, and too high when the supply is small. The summer supplier is thus overpaid and the winter supplier underpaid. I cannot conceive anything more likely to retard winter dairying, and the greatest sinners in this respect are often the loudest grumblers that winter dairying is not being taken up. The Department have, however, prevailed on the proprietors of a number of creameries to adopt a better system of allocating costs, with successful results, the winter supplies in these cases showing a tendency to increase. The change, however, must be a slow one.

The main reasons, in my opinion, for the apparent decrease in butter exports are increased home consumption, the increase in the trade by parcel post and passenger train, and the increases in the export of milk, cream and cheese. The decrease in the manufacture of butter, if any, would appear to be in the butter made on the farm, and not at the creamery, as, taking figures for a number of creameries, I find their output has increased.

#### IV.—QUALITY.

We may now ask what improvement has taken place in the quality of our butter. This is often estimated by the movement of prices, but there are three factors entering into that which have no bearing on quality. These are "salesmanship," the world's production, and the state of trade. A first class butter may be sold at less than its intrinsic value by a bad salesman. A good season in Siberia, New Zealand, or Australia, may result in a glut of butter on the markets. Finally, bad trade may reduce the purchasing power of the public.

Fortunately we have in our butter inspections and in the reports from buyers in the United Kingdom a means of ascertaining whether any improvement has been effected. The general opinion amongst them is that not only is the quality of the best higher, but that the general average is rising. The whole of the butter is being graded up, and now it is a frequent statement that there is no better butter on the market, the only regret being that the supply is not steady the year round,

**V.—BUILDINGS AND EQUIPMENT.**

The improvement in buildings and equipment which commenced about the time of the former visit of this Association has been continued. Buildings are now put up with proper provision for lighting, so that dirt can be readily seen; and with suitable ventilation, so that the plant and premises are quickly dried. Ample room is now provided so that attendants can readily get round machines for cleaning purposes; good falls to flows and drains are given, all being conducive to keeping the premises in that sweet dry condition so essential for the production of good butter.

The lines of construction laid down in the early days have proved sound, and, where followed, it is impossible to design a bad creamery.

There still remains the notion, in a few minds, that if you get machinery it will necessarily make good butter, but this idea has almost disappeared. The real value of new plant is now better understood. Will it reduce labour and save room, such as the combined churn and worker does? Will it improve yields, such as the introduction of a better separator does? Will it effect economies in production, such as the feed water heater does?

Pasteurisation has made progress, but the question of whether to pasteurise the whole milk or the cream and separated milk is still undecided. The advocates of the system of pasteurising the cream only hold that it costs less, that the milk is not fit to stand pasteurising, and that there is no necessity to pasteurise the separated milk. Those supporting the pasteurising of the whole milk say it requires one machine in place of three, that there is less danger of getting a greasy or burnt butter, that less room is required, interest and depreciation are lower, less labour is required in cleaning, and that the saving in oil, belts, labour, &c., more than counterbalances the extra steam consumption, and, finally, that there is no risk of spreading disease to man or to cattle. Personally, though I introduced pasteurisation, and copied the Danes with their three heaters, I am now, as the result of over twenty years' experience, in favour of heating the whole milk up to pasteurising temperature and of rejecting milk which will not stand the heat test.

**VI.—COMMERCIAL ASPECTS.**

We now come to a most important item. Quality must be the first aim of the producer. But quality without good salesmanship and economical production is not sufficient. Having got to the stage of making an article of the highest quality we must aim at economical production and good salesmanship. Of recent years there is a greater tendency to examine into the costs of production, though to many this is the least attractive part of the management of a business. At the same time, the greater number of failures in manufacturing concerns can be traced to careless accountancy work, or to not studying the

figures obtained and learning the lessons taught by them. Though there has been a very great improvement, there is ample room for further economies, as is evident from the figures of costs given in the accompanying tables.

TABLE IV.

COST OF MANUFACTURING ONE CWT. OF BUTTER, ARRANGED  
ACCORDING TO OUTPUT OF A NUMBER OF CREAMERIES AND  
CREAM SEPARATING STATIONS FOR 1910.

Milk Supply— Gallons.	*29 Cream Separating Stations.			59 Creameries without Cream Separating Stations.		
	Average.	Max.	Min.	Average.	Max.	Min.
	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.
50,000–100,000	20 11	28 9	13 9	24 5	32 9	17 4
100,000–200,000	15 7	18 4	12 0	18 11	23 0	15 5
200,000–300,000	12 2	16 3	10 7	13 5	16 1	9 9
300,000–400,000	—	—	—	11 2	13 1	9 8
400,000–500,000	9 10	10 4	9 5	9 8	12 1	8 2
500,000–600,000	—	—	—	9 3	10 7	8 3
600,000–800,000	—	—	—	8 8	10 3	7 9
800,000–1,000,000	—	—	—	8 1	9 5	7 3
Over 1,000,000	—	—	—	—	—	—

\* Includes an average charge of 4s. 8d. per cwt. by the creamery for churning and marketing. This charge varies from 3s. 10d. to 7s. per cwt.

Milk Supply— Gallons.					26 Creameries with Cream Separating Stations.		
					Average.	Max.	Min.
					s. d.	s. d.	s. d.
50,000–100,000	...	...	...	...	33 4	—	—
100,000–200,000	...	...	...	...	17 4	21 3	14 0
200,000–300,000	...	...	...	...	15 1	18 10	11 9
300,000–400,000	...	...	...	...	14 6	19 10	10 0
400,000–500,000	...	...	...	...	15 5	18 7	13 10
500,000–600,000	...	...	...	...	9 4	—	—
600,000–800,000	...	...	...	...	12 1	13 11	11 1
800,000–1,000,000	...	...	...	...	12 2	15 1	9 4
Over 1,000,000	...	...	...	...	13 7	—	—

TABLE V.

COST OF MANUFACTURING ONE CWT. OF BUTTER, ARRANGED  
ACCORDING TO OUTPUT, 1911.

Milk Supply— Gallons.	* 57 Cream Separating Stations.			28 Creameries without Cream Separating Stations.		
	Average.	Max.	Min.	Average.	Max.	Min.
	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.
50,000–100,000	20 4	31 0	11 1	23 11	28 4	18 0
100,000–200,000	16 11	36 7	12 2	21 2	28 3	17 11
200,000–300,000	12 7	15 11	11 5	12 11	16 9	9 2
300,000–400,000	10 3	10 11	9 7	11 6	13 3	9 11
400,000–500,000	—	—	—	10 3	11 2	9 2
500,000–600,000	—	—	—	9 4	11 11	8 0
600,000–800,000	—	—	—	9 2	11 10	7 11
800,000–900,000	—	—	—	8 5	8 10	8 0

\* Includes an average charge of 4s. 8d. per cwt. by the creamery for churning and marketing. This charge varies from 3s. 10d. to 7s. per cwt.

Milk Supply— Gallons.	24 Creameries with Cream Separating Stations.		
	Average.	Max.	Min.
	s. d.	s. d.	s. d.
200,000–300,000 ...	18 4	21 4	14 2
300,000–400,000 ...	14 11	21 2	8 4
400,000–500,000 ...	12 10	15 0	7 4
500,000–600,000 ...	16 10	21 10	11 10
600,000–800,000 ...	10 11	14 3	7 5
800,000–1,000,000 ...	12 5	15 3	11 0
Over 1,000,000 ...	14 6	—	—

It will be seen that the differences in the costs of production are far too great, even in the case of creameries with approximately the same milk supplies. Why is this? If you split the costs up into "fixed charges" such as rent, rates, interest on capital, depreciation, salaries and wages of the permanent staff, and into "variable charges" such as coal, oil and waste, packages, testing materials, &c., all of which vary with the output, you still find far too large differences between the figures from creameries with the same output. It indicates that sufficient attention is not paid to this branch of the business, that owners or committees are not sufficiently alive to the importance of having the annual statements made out in such a form as to enable comparisons to be made. It is evident that greater care must

be exercised in controlling costs. There appears to be an opening for the collection, examination and collation of creamery statistics, and for the drafting of the annual statements so that those concerned can understand them and compare their results with those of creameries similarly circumstanced.

TABLE VI.

TABLE SHOWING SUMMARIES OF THE WORKING OF A  
NUMBER OF CREAMERIES FOR THREE YEARS.

	66 Creameries.	114 Creameries.	110 Creameries.
	1909.	1910.	1911.
Gallons of milk received .. ..	28,875,513	39,627,381	38,347,212
Butter produced lbs. ....		16,573,918	16,016,040
Gallons of milk to produce 1 lb. of butter .. .. .	-	2.39	2.39
Total amount received for butter ..		£801,183	£822,701
Price received per cwt. for butter f.o.t.	107s. 3d.	108s. 4d.	115s.
Total of fixed expenses .. ..	-	-	£40,153
Fixed expenses per cwt. of butter ..	-	-	5s. 7d.
Total amount paid for milk ...		£704,652	£717,069
Paid for milk per gallon* .. ..	4.25d.	4.267d.	4.488d.
Total profit after charging depreciation	-	£11,243	£15,270
Profit on each gallon of milk ..	-	.068d.	.095d.
Total expenses .. .. .		£87,358	£87,745
Cost of manufacturing 1 cwt. of butter	11s. 9d.	11s. 10d.	12s. 3d.

\* Separated milk and buttermilk being returned free to suppliers.

In those cases where the costs are being properly kept—an increasing number—the costs are being brought down year by year with great financial advantages to all concerned. Stocks are checked monthly and unsuspected leaks discovered. Annual statements are being more fully elaborated, so that the humblest shareholder can measure the progress of his society.

A practice which is not to be commended is that of considering the proportion of working expenses to the “turnover.” It often conveys a false impression to shareholders. If prices for dairy produce were uniform from year to year, or between creameries, then the percentage of working expenses on turnover might be a satisfactory method of ascertaining whether the costs of production were being reduced or bore a satisfactory relation to the turnover. The expenses per cwt. of butter may have increased, yet, because of a rise in the price of butter and the consequent increase in the value of the turnover, the percentage of expenses to turnover may have fallen, and the opposite holds good.



The only method of arriving at a true comparison is to work out the costs of manufacture per cwt. of butter. The cost of some items, such as coal or oil, the consumption of which vary with the quantity of milk rather than the quality, should also be calculated per 1,000 lbs. or 100 gallons of milk. Either standard suffices as long as it is uniformly adopted. The former is, however, to be preferred.

The manager, committee or shareholders cannot suffer from a clear businesslike statement at the close of the year's work. The report of the directors can thus be confined to the simple explanation of increases or decreases in charges, such as a rise in the price of timber making packages more costly, or the addition of new plant involving increased charges for depreciation. However, an improvement is taking place, and owners are realising that if they are to command the services of competent men to do such work higher salaries must be offered and suitable assistance provided. The old idea that anyone could manage a creamery or dairy business is being slowly but surely eradicated.

The following is an instance of the improvement which may be brought about. In the case of one creamery paying close attention to the costs of production and to obtaining increased yields, the estimated saving during the last year as compared with the expenses and yield of the first year, amounted to nearly £1,000. In addition the salesmanship had been improved, yielding further profits.

As to "salesmanship," while we have improved our position immensely, I look forward to still greater advances. When, however, we come to compare prices of Irish creamery butter with those of foreign butter we are confronted with the fact that the quotations for Irish are greatly below those of its competitors; but during the greater part of the winter months, when prices are at their best, the Irish production is at its lowest; and the best then is sold privately, and its price is not included in the trade reports. The figures there found represent the inferior quality which a manager does not care to send out to his regular customers, preferring to sell it on the open market for what it will bring, or creamery butter which has been cold-stored, or so-called creamery butter, a blend of farmers' butter, or it may be hand-separated butter. In the last mentioned cases it is a very difficult matter to bring a successful prosecution under the Merchandise Marks Act owing to the lack of a statutory definition of what creamery butter is, which defect I hope may be removed by the passing of the Irish Creameries and Dairy Produce Bill at present before the House of Commons.

TABLE VII.

AVERAGE F.O.R. PRICE RECEIVED PER OWT. OF BUTTER FOR EACH MONTH, TOGETHER WITH THE MINIMUM AND MAXIMUM PRICE RECEIVED AT ANY ONE CREAMERY DURING THE MONTH.

Month.	1910.						1911.					
	114 Creameries.						110 Creameries.					
	Average.		Max.		Min.		Average.		Max.		Min.	
	s.	d.	s.	d.	s.	d.	s.	d.	s.	d.	s.	d.
January ...	124	3	136	2	112	0	121	10	136	6	113	6
February ...	127	2	137	8	113	3	124	5	137	0	111	0
March ...	126	3	142	6	112	7	116	10	130	10	106	5
April ...	119	0	139	11	108	3	107	10	131	0	103	3
May ...	104	9	123	11	99	10	103	3	112	0	95	0
June ...	102	7	110	0	95	0	103	5	109	10	99	2
July ...	103	3	111	6	99	7	108	6	118	0	97	6
August ...	106	3	113	0	103	0	120	0	126	0	116	0
September ...	110	6	117	6	106	4	122	7	129	3	117	6
October ...	110	11	120	0	104	11	126	8	136	0	121	6
November ...	110	2	128	6	102	8	128	6	142	0	122	6
December ...	116	10	131	0	106	0	131	9	164	8	125	5
Average ...			s.	d.					s.	d.		
			108	4					115	0		
Highest Individual												
Average			119	9					120	9		
Lowest Individual												
Average			103	0					111	2		

TABLE VIII.

SHOWING ANNUAL PRICES FOR DANISH AND IRISH CREAMERY BUTTER.

Year.	Average landed price for Danish.		Average landed price for Irish Creamery Butter.		Average F.O.R. price for Danish.		Average F.O.R. price for Irish. †	
	From trade papers.		From trade papers.		Danish Statistics.			
	s.	d.	s.	d.	s.	d.	s.	d.
1904 ... ..	—	—	†	†	102	9	—	—
1905 ... ..	—	—	†	†	106	9	—	—
1906 ... ..	118	4	†	†	112	2	—	—
1907 ... ..	115	2	†	†	108	8	104	10
1908 ... ..	121	8	114	10	115	9	110	8
1909 ... ..	119	0	110	1	110	4	107	3
1910 ... ..	120	6	111	9	115	4	108	4
1911 ... ..	125	10	118	6	115	4	115	0
1912 ... ..	130	0	118	10*	124	6	115	3*

\* Calculated on average of percentage output for four previous years.

† From figures collected by Instructors in Dairying.

‡ Cannot be determined, as quotations did not appear in trade papers for whole of year.

We find, moreover, that foreign butters are quoted week after week with the greatest regularity. We are competing against an article which is no better than our own, but has the advantages of a hold on the market and continuity of supply. Many wholesale merchants will not sell Irish creamery butter as a first "line," because they cannot get it throughout the year. They rather prefer to buy it as a second "line" to sell at 1d. per lb. cheaper than the foreign article. Again, if the packages of foreign butter are examined, in addition to the brand of origin, the trade-mark or name of the particular creamery will be found, while the Irish is not branded at all, or in very few cases only. The effect on the trade is as follows:--A grocer, getting the butter of the same foreign creamery week after week and finding it pleases his customers, very often merely orders by brand and does not examine the butter critically, if at all, when it arrives. Even if he does so, as long as it is fair in quality he accepts it on account of his past experience, realising that there must be slight variations in the produce of all makers. The grocer very often pays 1s. to 3s. extra per cwt. in order to get a brand he fancies. In the case of Irish creamery butter, through the absence of an individual brand, the grocer is never able to tell whether he is getting the same make each week, and must therefore examine the butter very critically. Any departure from a high standard is strongly commented on, and when, as is sometimes the case, the butter differs in any respect from that of the previous week, there are faults found and the grocer assumes that all Irish creamery butter lacks uniformity. These facts have driven many of our managers to find other customers than the wholesale merchants, who, they complain, will not push Irish creamery butter as they do foreign. The result is that a large quantity of Irish creamery butter is sold at firm prices from the creamery and does not come on the open market, and is realising higher prices than the open market prices you see quoted in the trade papers or daily Press. The surplus butter from this trade and the butter sent on consignment is all that goes into the open market. In winter, when supplies are small, there is no surplus of any kind, hence the practical disappearance of open market quotations. The trade in small lots of 1-lb. rolls by passenger train is increasing, and while prices may be cut a little in this trade by beginners, the whole tendency is for the managers to stiffen prices as their business connection gets wider and wider.

TABLE IX.  
PRICES FOR BUTTER TAKEN FROM VARIOUS SOURCES  
EACH MONTH OF THE YEAR, 1912.

Month.	Average landed price per cwt. of Danish. From trade papers.		Average landed price per cwt. of Irish Creamery Butter. From trade papers.		Average F.O.R. price per cwt. of Irish Creamery Butter. Collected by the Department.		Average of F.O.R. price per cwt. of Irish Creamery Butter. Issued by Irish Creamery Managers' Association.		Manchester top-landed prices per cwt. for Irish Creamery Butter From trade papers.	
	s.	d.	s.	d.	s.	d.	s.	d.	s.	d.
January ...	137	2	133	2	135	2	—	—	135	0
February ...	136	10	132	3	135	0	—	—	134	3
March ...	137	9	130	5	128	9	—	—	133	2
April ...	129	9	119	6	115	10	117	3	124	6
May ...	119	1	112	0	107	9	107	2	114	0
June ...	121	4	112	8	106	10	107	10	115	5
July ...	122	7	114	1	110	1	108	3	116	3
August ...	130	3	119	8	114	8	113	11	123	4
September ...	130	10	121	6	118	2	115	10	125	3
October ...	132	3	127	8	122	11	122	8	130	9
November ...	130	9	123	11	122	7	120	0	128	0
December ...	132	1	122	1	129	4	121	0	127	9
Average ...	130	0	*118	10	*115	3	—	—	*122	3

\* Calculated on average monthly output.

This table shows clearly the effect of the irregular production of Irish Creamery butter on the prices of Danish and Irish butter.

It is stated that about three-fifths of the Danish butter is sold to two English firms, leaving two-fifths of their output for the rest of this trade in the United Kingdom and Germany, as well as the export trade of tinned butter.

TABLE X.  
SHOWING MONTHLY F.O.R. PRICES OF FOUR CREAMERIES FOR  
THE YEAR 1912.

Month.	Butter per Cwt.				Milk.		Cream.		Separated Milk	
	s.	d.	s.	d.	s.	d.	s.	d.	s.	d.
January ...	140	0	136	0	139	2	132	0	—	7 0
February ...	140	0	135	0	139	2	132	0	—	7 0
March ...	140	0	134	0	127	6	124	8	—	7 0
April ...	124	0	124	0	117	4	110	10	—	6 3
May ...	109	6	111	0	109	6	107	2	—	6 6
June ...	111	0	109	0	109	8	107	7	—	6 1
July ...	111	6	111	6	111	11	111	0	—	6 7
August ...	124	0	117	0	115	7	115	9	—	6 5
September ...	124	6	120	0	119	1	119	6	—	6 8
October ...	128	0	123	8	124	4	124	3	—	7 0
November ...	135	6	124	0	122	5	121	8	0 9½	7 0
December ...	140	0	128	0	131	0	129	0	0 9½	7 5
Average	122	6	117	7	116	2	115	11	—	—

**F.O.R. PRICE PER CWT. OF BUTTER FOR 1913 OBTAINED FROM  
A NUMBER OF CREAMERIES.**

	s. d.	
January ... ..	129	4
February ... ..	133	0
March ... ..	123	10

Inquiries made a few years ago disclosed that the wholesale trade in Irish creamery butter was in the hands of about ninety firms. With the exception of three or four, the majority were buying in certain districts only, so that there was not much competition amongst them. We want, and I am glad to say we are securing slowly but surely, a "wider selling front," and consequent better prices.

When we look back on the creamery industry and consider that it was started without trained men, that a manager has to be at the present day somewhat of an engineer, chemist, bacteriologist, works manager, salesman, and accountant, I consider the progress is wonderful and reflects the greatest credit on the owners and workers. There is still a call for enthusiasm, patience, and perseverance, without which one cannot be successful.

**TABLE XI**

**AVERAGE PRICE PAID (IN PENCE PER GALLON) FOR MILK  
DURING EACH MONTH, TOGETHER WITH THE MAXIMUM  
AND MINIMUM PRICES PAID AT ANY ONE PLACE DURING  
THE MONTH.**

(Separated Milk and Buttermilk returned free.)

Month.	1910.			1911.		
	114 Creameries.			110 Creameries.		
	Average.	Max.	Min.	Average.	Max.	Min.
	d.	d.	d.	d.	d.	d.
January ... ..	4.76	6.00	3.78	4.95	7.69	3.41
February ... ..	4.66	6.62	3.73	4.72	7.53	3.59
March ... ..	4.53	5.83	3.83	4.33	5.02	3.48
April ... ..	4.17	5.10	3.67	3.98	5.00	3.43
May ... ..	3.77	4.56	3.25	3.76	4.50	3.28
June ... ..	3.78	4.12	3.42	3.81	4.22	3.40
July ... ..	3.91	4.23	3.52	4.02	4.60	3.10
August ... ..	4.11	4.55	3.57	4.60	5.25	3.58
September ... ..	4.41	4.95	3.75	4.83	5.86	3.96
October ... ..	4.70	5.50	3.93	5.31	6.65	4.10
November ... ..	5.01	6.25	4.20	5.75	7.25	4.20
December ... ..	5.14	6.72	4.23	5.81	7.52	4.12
	d.			d.		
Average for year	4.26			4.49		
Highest Individual average ... ..	4.66			5.01		
Lowest Individual average ... ..	3.76			3.59		

TABLE XII.

SHOWING THE NUMBER OF GALLONS OF MILK REQUIRED TO YIELD 1 LB. OF BUTTER DURING EACH MONTH OF THE YEAR, WITH THE MAXIMUM AND MINIMUM FIGURES FOR ANY ONE CREAMERY DURING THE MONTH.

Month.	1910.			1911.*		
	114 Creameries.			110 Creameries.		
	Average.	Max.	Min.	Average.	Max.	Min.
January ... ..	2.30	2.66	1.88	2.23	2.72	1.77
February ... ..	2.44	2.80	2.02	2.44	2.96	1.77
March ... ..	2.54	3.00	2.16	2.54	3.00	2.13
April ... ..	2.58	2.90	2.17	2.64	3.19	2.20
May ... ..	2.56	2.76	2.26	2.59	2.77	2.35
June ... ..	2.54	2.66	2.33	2.55	3.26	2.32
July ... ..	2.47	2.65	2.27	2.48	2.62	2.33
August ... ..	2.39	2.52	2.15	2.40	2.84	2.19
September ... ..	2.28	2.44	2.03	2.31	2.48	2.07
October ... ..	2.16	2.33	2.00	2.14	2.38	1.91
November ... ..	2.01	2.41	1.73	2.03	2.33	1.69
December ... ..	2.01	2.42	1.57	2.04	2.42	1.60
Average ... ..		2.39			2.39	
Highest individual average ... ..		2.51			2.58	
Minimum individual average ... ..		2.25			2.29	

\* Very hot and dry year.

TABLE XIII.

PERCENTAGE OF WATER FOUND IN IRISH CREAMERY BUTTER.

NUMBER OF SAMPLES ANALYSED, &c.

% of water.	1906 to 1909.	1910	1911.	1912.	Total 1906-1912
9-10 ... ..	7	1	12	4	24
10-11 ... ..	49	3	31	32	115
11-12 ... ..	112	6	57	104	279
12-13 ... ..	193	22	82	203	500
13-14 ... ..	196	16	61	189	462
14-15 ... ..	89	4	10	85	188
15-16 ... ..	38	2	7	10	57
16-17 ... ..	1	—	—	2	3
17-18 ... ..	1	—	—	1	2
Over 18 ... ..	—	—	—	2	2
Totals ... ..	686	54	260	632	1,632
Average % water	12.88%	12.90%	12.30%	12.91%	12.8%

## VII.—OTHER BRANCHES OF DAIRYING.

As is generally known, the enormous industrial population of Great Britain is calling for more and more milk. There is, consequently, less left for manufacture into cream and cheese. Both are required, and this gives an exceptional opportunity to Ireland. It can be seen from the statistics given that Ireland has entered even into the new milk trade, and there is no reason why this should not increase where the fast train services are suitable. We can supply milk quite as good, and in as clean vessels, as England or Scotland. Cream is sent the whole year round across the Channel, and the trade is undoubtedly developing. With regard to cheese: formerly it was held that good cheese could not be made outside certain favoured localities. This idea has been exploded long since. In Ireland first-class Stilton, Cheddar, Caerphilly, and Derby cheeses have been made, and this work is bound to extend.

Cheddar and Stilton cheese-making have not greatly developed because of the long wait for returns, involving the locking up of capital. Moreover, Cheddar is supplied from all parts of the world. The opening here is rather for the manufacture of Caerphilly, Derby, Cheddar loaves or truckles, for all of which there is a ready market in Great Britain. Competition from abroad is not so likely to be as keen in these makes as in others.

Some of your members have visited one of our Caerphilly cheese factories. There are in addition three Cheddar cheese factories, nine Caerphilly, and one making both Cheddar and Derby.

I anticipate further developments along this line. The merchants praise the quality, and we find our prices good as compared with British. The capital involved in erecting a cheese factory is about one-third of that required to erect a creamery. Further, if the investigations into the manufacture of cheese from pasteurised milk prove satisfactory when applied on the commercial scale, it may lead to a great extension of cheese-making in this country. We can get clean milk; we have clean creameries and factories, and, under skilful makers, there is no reason to doubt success.

The manufacture of dried milk has been carried on in Ireland, but owing to the installation of unsuitable machinery it was not a commercial success. Nor do I think it wise to take up the manufacture of any article which can be put on the market from the four corners of the earth by those who can produce the raw material cheaper than we can.

The manufacture of dried casein from separated milk has been taken up, but the returns have not been satisfactory, the net yield, after allowing for costs of management, fuel, labour, &c., being about  $\frac{3}{4}$ d. to  $\frac{1}{2}$ d. per gallon for the separated milk.

## VIII.—MILK PRODUCTION.

Having dealt with the progress in connection with the handling of milk, I will touch shortly on the development of cow-testing

associations. Up to a few years ago very little interest was taken in cow testing, it being looked on as a fad ; everyone thought he knew all there was to be known about his cows. As a matter of fact very few knew the yield of their cows, still less the average yield of the cows in the country. After a good deal of trouble the first cow-testing association was formed by a co-operative creamery in the year 1909. It consisted of five members, and gradually fell to three towards the close of the milking period. However, from that small beginning the number of associations has grown till in the month of April last there were 72 with 735 members and 7,868 cows, and the numbers are still increasing. Farmer after farmer who has joined has been surprised at his lack of knowledge of the milk yield of his cows.

The Department have at present two instructors whose sole duty is to organise such associations, and two others whose duty is to check weighings and to take samples for analysis.

I do not think it necessary to take more than one instance out of many, but one farmer with a herd of about 50 cows found he had cows giving the following in his herd :—

					Lbs. of Milk.		Lbs. of Butter Fat.
(1)	...	..	...	...	8,120	...	254
(2)	...	...	...	...	7,231	...	257
(3)	...	...	...	...	3,486	...	128
(4)	...	...	...	...	3,130	...	141
Average for herd				...	5,858	...	209

He estimates that the testing will be worth to him about £70 per annum.

Efforts are being made to start these associations in every district, and they will be encouraged by all owners of creameries as one of the methods by which they can increase the supplies of their raw material and so enable them to reduce the costs of production and pay higher prices for milk.

By the elimination of cows with poor yields, and their replacement with better cows, it is considered that the milk production of Ireland can be increased by one-third to one-half without any appreciable increase in cost to the farmers. Based on present yields and prices this would mean an increased receipt of somewhere between two and one-half to three and one-half millions sterling.

In conclusion, I hope that, with the aid of the various leaflets, you may obtain a clearer understanding of the nature of the dairy work carried on in Ireland.



## THE DAIRY SHOW OF 1913.

By SAMUEL R. WHITLEY.

THE thirty-eighth Show of the Association was held in the Agricultural Hall, Islington, on October 21st, 22nd, 23rd, and 24th, the dates being about a fortnight later than has been customary in recent years. For a long period some of the members of the Council, with great experience behind them, have wished to hold the Show rather later in the month of October, and a new contract (starting in 1913) for renting the Agricultural Hall gave the Council the opportunity for making this change. It should be noted that the dates for future years will be as follows :—

In 1914 .. ..	October 20th, 21st, 22nd and 23rd.
„ 1915 .. ..	October 19th, 20th, 21st, and 22nd.
„ 1916 .. ..	October 17th, 18th, 19th, and 20th.
„ 1917 .. ..	October 23rd, 24th, 25th, and 26th.
„ 1918 .. ..	October 22nd, 23rd, 24th, and 25th.
„ 1919 .. ..	October 21st, 22nd, 23rd, and 24th.

The somewhat later date seems to have been fully justified by the great and increased success of this Show, the entries in the competitive classes being no less than 361 above the previous record of 1908.

The benefit of the later date was felt in two or three directions ; for instance, the cattle were more comfortable in the Hall and did not suffer from the great heat often experienced early in October. The exhibitors of poultry welcomed the fortnight's extension of time in which to get their birds to perfection by sending 490 more exhibits than were sent last year ; also one noticed an increased attendance on the part of the agricultural community, which may be accounted for by their having found the first week in October too near the farm changes and valuations which Michaelmas brings in its wake.

The total of money received at the turnstiles also created a record. The demand for stand space was as keen as ever, and the following table of competitive entries goes far to prove the satisfactory nature of the Show :—

	1907.	1908.	1909.	1910.	1911.	1912.	1913.
Cattle ... ..	237	247	232	288	222	210	286
Milking and Butter Tests ...	245	224	236	264	213	209	265
Goats ... ..	48	72	84	75	81	105	110
Poultry ... ..	3,081	3,280	2,997	3,259	3,300	3,350	3,840
Pigeons ... ..	2,664	2,564	2,282	2,280	2,226	2,456	2,467
Poultry and Pigeon Appliances	65	50	37	—	—	—	—
Cheese ... ..	420	357	355	362	249	343	395
Bacon and Hams ... ..	57	76	55	104	58	71	89
Butter ... ..	593	668	535	525	484	618	549
Cream ... ..	35	47	42	47	26	48	43
Skim-Milk Bread, &c. ...	118	135	115	98	72	83	64
Honey, &c. ... ..	67	85	88	96	87	95	106
New and Improved Inventions	33	37	31	34	21	25	41
Roots ... ..	177	181	218	196	172	190	190
Buttermaking Contests ...	200	207	120	145	165	165	141
Milkers' Contests ... ..	135	132	126	122	153	119	137
	8,175	8,362	7,553	7,895	7,520	8,127	8,723

It was extremely difficult to find satisfactory accommodation for the increased entry of cattle, and in order to do this the Council found it necessary to abandon the idea of having a large judging ring in the centre of the Hall, which they had been planning in order to give more satisfactory space for the Inspection-judging on Tuesday morning.

Although the entire space of the outer yard and part of Barford Street were used for the first time for Inspection-judging on Tuesday morning, there was still some dissatisfaction with the accommodation available, and it may be well here to state some of the difficulties of the problem which the Council are anxious to overcome if it be possible.

If "overstocking" is to be avoided and the cows are to be judged for Inspection in the presence of the public before milking out on Tuesday morning, 18 or 19 classes have to be judged in two to three hours. Each class requires an average of about half an hour for judging, the larger classes exceeding this time considerably, so that, if the general scheme of the Show is to be maintained, at least four or five fair-sized judging-rings are required, and while the provision of one central ring may improve the judging of the larger classes, it does not altogether solve the whole problem, and it must be remembered that, under the present scheme of arrangement, these large open spaces are only desirable for two or three hours early on Tuesday morning.

The Council are aware of the difficulty and of the extreme desirability of giving adequate accommodation for Inspection-judging and

would give their most careful consideration to any suggestions which seem likely to solve the problem in a satisfactory manner.

### *Cattle.*

The cattle entries exceeded those of 1912 by 76, and as far as possible the relative positions of the various breeds were maintained as in previous years, but the large number of entries in the Milking Trials and Butter Tests made it impossible to have all such entries in a ring fence, an arrangement which much facilitated the Trials during the last three or four years.

The pedigree Shorthorn cows entered in Class 1 numbered 41, and the Judge rightly remarked that both for quantity and quality such a class had never been seen before at the London Dairy Show. The pedigree Shorthorn heifers, numbering 28 entries, also beat the record, thus giving convincing proof of the great popularity of the pedigree dairy Shorthorn, though the Judge did not consider the heifers equal in merit to the cows.

For Inspection, Mr. J. Ellis Potter's Lady Clara was placed first in the Cow class, but this cow did not come into prize money for the Milking Trials, and so Mr. Samuel Sanday's Greenleaf 32nd, being second for Inspection and first in the Milking Trials, carried off the Shorthorn Society's prize for the combination of Inspection and Milking Trials.

Messrs. R. W. Hobbs & Sons, of Kelmscott, won reserve for Inspection and second prize for Milking Trials with Rose 44th in the Cow Class; and, in the Heifer Class, second prize for Inspection with Rose 50th, third prize with Spotless 31st, while this order was just reversed for the same animals in the Milking Trials.

Class 3, for Non-pedigree Shorthorn Cows, was slightly disappointing for Inspection, but in the Milking Trials they stood well above their pedigree rivals, the prize-winners gaining some 20 to 25 per cent. more points, thus carrying off the most coveted honours in the shape of the Barham Cup, the Shirley Cup, and the reserve to the Spencer Cup, the fortunate animal being Mr. F. B. Wilkinson's Sherwood Rose 2nd with the wonderful score of 158 points. The Non-pedigree Heifer Class was a good one with 15 exhibits, and the winners were high up in the Milking Trial points.

The Lincoln Red Shorthorns were considered by the Judge as hardly as good as usual, and their scores in the Milking Trials call for no special comment.

The general quality of the Jerseys was considered excellent, though the Judge reports several inferior animals in the Island Heifer Class and suggests that in order to save space, this class should be dropped in future shows.

In the Milking Trials for Jersey Cows, Mr. J. H. Smith-Barry of Stowell Park, Wiltshire, was specially successful, carrying off the first and second prizes, and the reserve, although the second prize winner, Promise, calved in April.

The class for Guernsey Cows brought 13 entries, while the Heifer Class had six entries. This is an improvement on some recent Dairy Shows, and one noticed with pleasure two or three new exhibitors. The winner in the Cow class displayed an exceptionally good udder, and the general results in the Milking Trials were well up to the average at this show.

The Judge reported the two Red Poll Classes to be very good, the winners having exceptional milking qualities, a fact which was well borne out by the result of the Milking Trials, when the prize takers scored points well above the standards for the breed.

The class for Ayrshire Cows was hardly up to that of last year, when the President offered an extra prize of £10, but the prize-winning animals were very good representatives of the breed and just the class of cow wanted in Ayrshire.

South Devons were poorly represented numerically, though the Judge reported the quality as excellent, and hopes that both the Breed Society and the British Dairy Farmers' Association will encourage this class in the future.

The entries for Kerry Cows were five in number, the same as last year.

The class for Dexters again produced no entries.

Classes 18 and 19 for Cows required by the Association for the purposes of their Milkers' Contests brought an increased entry compared with 1912, but more cows are still required for this purpose. Class 18 for Pairs of Cows was reported as the strongest seen for some years, while Class 19 produced some first rate animals.

### *Goats.*

The Goat entries in 1912 beat all previous records, and those of 1913 were five ahead of last year. No less than 26 goats were entered for the Milking Trials and throughout the quality of the milk produced was of a very high standard, though it is difficult to detect any large increase of the quantity of milk produced by each goat. The writer remembers a goat at this show once producing the full gallon in the 24 hours, but for several years this high standard has not been reached.

The Inspection Judge reports the exhibits generally as of a very high standard, and recommends that in future more than one prize should be offered in the Champion Class.

### *Cheese.*

The entries of Cheese were over 50 more than last year, and numerically were not far short of the record, which was reached in 1907. With one or two exceptions, the quality of the Cheese as reported on by the various Judges was good.

*Cheddars.*—The judging of these classes was placed in the hands of one English and one Scotch Factor, as last year. In the class for Four Cheeses the Judges had no difficulty in agreeing on the first prize, but on the relative merits of the remaining exhibits, although both men are of the highest standing and experience, it was found impossible to reach

agreement, and the Referee was called in, which caused considerable delay, and, as was natural under the circumstances, the Referee took different views from the Judges. Finally Scotland carried off the 2nd and 4th prizes, while the West of England secured the 1st, 3rd and 5th honours. Again for Class 35 (20 Cheeses), it was necessary to call in the Referee, as the two Judges failed to agree. The prize money again was divided by the two countries, the West of England scoring most. Cheddar Truckles were hardly as good as the favourable year would lead one to expect, and were characterised by one of the Judges as rough and untidy.

In his Judge's report, Mr. C. Henry White of Frome, a man whose experience and knowledge of Cheddar Cheese is of the very highest, strongly urges that in future at the Dairy Show the Scotch and English exhibits of Cheddar Cheese should be divided into separate classes, and a Judge for each class appointed. Coming from Mr. White, this recommendation is certain to be thoroughly considered by the Council; but it may be well to point out that when this course was tried some years ago, the result was that the entries went down and the Scotchmen complained that it is not worth coming to the Dairy Show unless they can have their fling at their English confrères; and, since the Council made it known that they proposed to consult the Exhibitors of Cheddar Cheese from both districts on this question, strong opinions in favour of the present arrangement have been received from equally eminent experts, and it is a question as of old, "Who shall decide when doctors disagree?" The writer supposes that the decision must be left to the majority of the Council, but he also trusts that those interested will freely give the Council the benefit of their views on this vexed question.

The exhibits of Cheshire Cheese again showed a large increase in numbers on last year, which was no doubt largely due to Capt. R. W. Ethelston's generosity in providing a Champion Cup, value £10, for the best exhibit of Cheshire cheese, and also to his great kindness in providing the prizes, to the value of £20, for a "Novice" Class, open to those who have never won a first or second prize at the London Dairy Show.

The Cheshire Cheese Judges report very favourably on the exhibits generally, but in the 4-Cheese Coloured Class some seven to ten exhibits stood out as superior to the others, while in the Uncoloured Class more uniformity was found and it was difficult to award the premier positions.

The 20-Cheese Class hardly came up to expectations, the difficulty being, of course, in showing 20 cheeses of uniformity, but where prizes were awarded a high standard of quality was reached.

The Stilton Cheese Judge reports: "An ideal season for cheese-making leads one to expect ideal cheese, and this is what I found in both classes of Stilton cheese, exhibits of exceptional quality all through; those of Mrs. Skinner, to which the Lord Mayor's Cup was awarded, being perfect specimens of rich, mild, ripe cheese."

The class for Wensleydale (Blue-moulded) (six cheeses) produced 11 entries, and was a good one, better than usually found at the Dairy Show. The first prize lot were excellent, being well matured and blue. Those receiving second and third prizes were also good and blue, but not quite correct in flavour. Amongst the exhibits not mentioned, there were a number of excellent examples of the Wensleydale variety, but in most lots the selection had been at fault and some cheeses were exhibited which were hard and dry.

Although the class for Lancashire Cheese was not very large, the quality was excellent and the whole formed a very good representation of the free-textured and nutty-flavoured cheese for which Lancashire is noted.

The Judge of Double and Single Gloucester Cheese was surprised by the small number of entries considering the popularity of these cheeses, but considered the average of the exhibits to be very good, although in both classes the first prize winners were points ahead of any of the others.

Although the prize-takers in the class for Leicester Cheese were good, the remainder were very disappointing.

Of the class for Uncoloured Derby Cheese, the Judge reports: "The forward condition of this class was very marked, and the unmentioned lots were well below the average."

In her report, the Judge of Caerphilly Cheese remarks on the wide distribution of this cheese, coming as the entries did from dairies in Somerset, Derbyshire, Wiltshire, Glamorgan, Carmarthen, and Co. Kerry. The flavour of the first and second prize winners was excellent, but in the second-prize lot the centre of each cheese was hollow or dished, which, in the opinion of the Judge, detracted from their market value.

The class for Cream Cheese made from Pure Cream only was fairly well filled and produced some excellent cream cheeses.

The class for Gervais again proved disappointing in numbers, but with one exception the exhibits deserved high commendation.

When reporting on the class for Unripened Soft Cheese other than Cream Cheese or Gervais, the Judge draws attention to the fact that more points would have been gained had the exhibits been finished in a more attractive and neater style.

A new class for Colonial Cheddar Cheese brought 24 entries, being mostly drawn from New Zealand and Australia.

The exhibits were found to be faulty in flavour, weak in body and badly set up, with a number showing cloudiness in colour, though the prize-winners might be described as useful cheese.

According to the Judge (one of Britain's greatest experts in the making of cheese), the weakness in body to some extent might be accounted for from the fact that the cheese were too sweet made. A finer division of the curd after coagulation, more full development of acidity, with higher temperatures of scald, might be recommended as a remedy. Faulty colour in Cheddar Cheese very often follows mismanagement in the acidity quantity, more particularly at the time the whey is drawn from the curd. Milk kept at a high temperature

overnight is very frequently the cause of discoloration in the finished product.

Colonial factory managers should advise greater care in detail in the production of the raw material; and, as far as possible, thorough aeration and cooling of the evening's milk is to be recommended.

The ripening agent, or starter, should be procured from some reliable source, and a small percentage can be used with advantage in carefully kept milk, and more particularly during the cool months.

The appearance and finish of a good number of exhibits could be much improved, and the Judge would recommend that makers should give this part of their management greater attention, as it is most desirable to have all manufactured milk products placed before the consumer in the most attractive manner possible.

Only one collection of Colonial Dairy Produce was exhibited, and to this a silver medal was awarded, the Judge finding the butter very good, but the Cheddar cheese rather over-ripe and of moderate quality. The bacon in the collection was found to be good in quality and well cured, but not cut in a manner to suit the English market. The exhibit might have been made more interesting and attractive, and it is to be hoped that another year may bring forth something better and more representative.

#### *Butter.*

The total entries of Butter were 549 against 618 in last year's Show. The falling-off in numbers may partly be accounted for by the dry season and consequent increased demand for milk.

A suggestion has been made for the butter classes of the future that, as there was a marked difference in the flavour and quality of the butter produced in certain districts, the British Isles should be divided into districts and classes allotted to those districts. To this idea the Council has promised to give its earnest consideration. It is also suggested that in the 2-lb. classes all butters should be made in one uniform shape, viz., the plain brick shape.

In Class 67, open only to farmers, their wives, sons and daughters, occupying not exceeding 100 acres, and who have never won a prize in the butter classes at any of the Society's Shows, the winning and commended butters were all of good quality, but a few of the exhibits were overworked.

Class 68, for 2 lbs. of Butter in 1 lb. Lumps, free from Salt, the produce of Channel Islands Cattle and their Crosses, contained some excellent samples of butter reflecting great credit on the makers; the prize-winners were outstanding, and No. 953 was considered to be a perfect sample. Very few lost points through excess of moisture.

Class 69, for 2 lbs. of Butter in 1 lb. Lumps, slightly Salted, the produce of Channel Islands Cattle and their Crosses, was found to contain butters varying very much, several being of bad flavour, which the Judge considered due to the lack of care in the selection of the cream before churning; the prize-winners, however, were good and very equal, it being difficult to place them in order of merit.

The classes for Butter, the produce of Cattle other than the Channel Islands and their Crosses, were well filled and produced many excellent samples of butter.

Class 73, for Butter made from Scalded Cream, was not so well supported, and several of the butters were hardly firm enough, and all the exhibits had the characteristic scalded flavour.

Class 74, for Butters free from Salt, 2 lbs. in oblong pounds or bricks, shaped with Scotch hands, but without decoration or printing, was somewhat disappointing, several samples being badly made and others damaged in transit—the winners easily gained their position.

The class for 24 lbs. of Butter free from Salt, in boxes of 12 Rolls, was disappointing in flavour, and the packing in one or two instances was deficient, so that the shape of the rolls suffered.

The classes for Fancy or Ornamental Butter were not large, but proved of considerable interest to many visitors to the Show. The Judge had no difficulty in selecting the first prize-winner in each class and congratulated the exhibitor on her charming and realistic designs, though some of the exhibits were considered over-decorated.

Both Judges of the Colonial butter speak in very high terms of praise of the exhibits, which were again very numerous.

First prize in both the Salted and Unsalted classes was won by the Taieri and Peninsular Milk Supply Co., Ltd., of Dunedin, New Zealand, though judged by different Judges. This proved a great triumph for New Zealand, more especially as this Colony's exhibits in some recent Dairy Shows have been rather conspicuous by their absence, and no doubt the slightly later date of the Show has made it more possible for New Zealand to compete. The second prize-winner in the Salted Class was from Australia, and as far as flavour was concerned, competed well with the winner from New Zealand, but lacked the body of the latter.

While there were no really bad butters exhibited, the general run of Australian butter failed rather in the matter of texture, and, in general, the question of moisture was the drawback.

The appearance and finish left little to be desired—the boxes being of selected wood and lined with best quality of grease-proof paper. Some of the exhibitors would improve their quality if more attention were paid to the ripening of the cream.

### *Cream.*

For the first time, in order to obtain a uniform appearance in these exhibits, a suitable vesse was supplied by the Association, and the general appearance of this part of the Show was thereby enhanced.

Amongst the Clotted Cream many of the exhibits reached a very high state of efficiency, the most prominent fault amongst the unsuccessful being the lack of the true scald flavour.

The class for Cream other than Clotted Cream was a good one, but some of the exhibitors rather sacrificed the flavour in order to attain a high percentage of fat, thereby causing greasiness.



*Skim-Milk Bread and Scones.*

The entries in these classes have been on the down-grade for some years past, and this year's record was but half the number exhibited four or five years ago. The object of these classes at the Dairy Show is to encourage the economic use of skim or separated milk, and if they really help in this direction it would be well for the Council to consider how they may be further encouraged. The class for Scones was an exceptionally good one, but that for White Bread was inferior as a whole to those of the two previous years.

*Honey.*

The number of Honey exhibits has tended to increase for a number of years, and this year was better than has been seen at the Dairy Show for a long time. Light-run honey was especially good, but the sections of comb honey were few in number and, except for the actual prize-winners, poor in quality.

Two trophies were shown, both of them excellent, and forming a very attractive display.

*Bacon and Hams.*

The exhibits here were slightly more numerous than in the two previous years, and a novel feature was provided by the offer of a British Empire trophy for Two Sides of Bacon Smoked and Two Sides of Bacon Pale Dried, weight not less than 56 lbs. per side and not more than 68 lbs. per side. This competition brought together 22 competitors and included one from Canada and several from Australia, but the prizes were easily retained by the old country, the new Co-operative Bacon Factory at Hitchin obtaining premier honours. The Judge suggests that in future there should be a separate entry for Colonial Bacon cured in Wiltshire style in addition to this open competition.

Class 56, Pale Dried (Four Hamless Sides of Spring or Winter Cure), brought only four entries, though the quality was good. The other bacon classes were better filled and produced good competition.

In the Ham classes entries were not sufficiently numerous, though the quality was generally good. The class for Amateurs was said to be rather uneven, but on the whole very good.

*Roots.*

The number of entries was the same as last year, which, considering the dry year, may be considered satisfactory, though the new subdivision of the Swede classes seems to have caused some difficulty.

*New Inventions.*

There was a very large entry in this class, but in many cases the judges did not consider the inventions absolutely new, or if the idea was novel that it was of sufficient importance to justify them in awarding the medal of such a Society as the B.D.F.A.

The Silver Medal was awarded to Eduard Ahlborn for No. 1842, a self-elevating horizontal Pasteurizer, in which all the parts are interchangeable. The spindle is always horizontal, there is no bottom

heat, no stuffing box, and the live steam is automatically cut off by an alcohol regulator.

To the same firm was awarded a Bronze Medal for their Rotary Butterworker, No. 1844, which rises or falls without altering the gear, so as to deal easily with hard or soft butter; the judges here wish to say how much they were struck by the ingenuity and general good workmanship of all the machinery shown on this stand. The firm gained a further Bronze Medal for No. 1835, a combined Hygienic Cream or Milk Ripening and Cooling Vat, in which the ripener was the novel feature.

A Bronze Medal was awarded to Blackstone & Co., Ltd., Stamford, for their Vertical Portable Engine, No. 1845, with a new system of water cooling, the water being circulated by the exhaust gases, on the principle of the Humphrey's pump, giving a better supply of water to the cooling jacket.

The "Insula" Portable Cold Chamber, No. 1846, shown by the Dairy Outfit Co., Ltd., the judges considered to be a cheap and novel appliance for keeping a churn of milk cool, and therefore useful for small milk retailers. It consists of a wooden cylinder, with a layer of insulating felt, between two layers of wood standing some four feet high; it is put over the churn of milk, and an icebox placed on top. It is claimed that for sixpence a 17-gallon churn can be cooled from 48° to 41°, and kept at that temperature for 24 hours; this also gained a Bronze Medal.

No. 1849, a 330-gallon rope-driven "Princess" Cream Separator, exhibited by Watson Laidlaw & Co., Ltd., Glasgow, was awarded a Bronze Medal. This works on a conoidal buffer of rubber, has no bottom gear, but a simple self-centring spindle, only one lubricator, and a large, easily cleaned open chamber.

The judges were struck by the milk-testing appliances on Frank Bryan & Co.'s stand, and awarded a Bronze Medal to their Improved Centrifugal Milk and Cream Tester for large dairies and creameries, No. 1858, which is steam heated, has angled cog with worm and free wheel gearing, glycerine speed indicator, and a solid cover in case of accident.

The "Amo" Milking Machine, No. 1863, exhibited by the Omega Milking Machine Co., Sweden, also gained a Bronze Medal, the novel features being that it is one of the first suction milking machines to be cow-borne, which renders it very difficult for the animal to dislodge it. The use of rubber is reduced to a minimum, the milk being conveyed from the teat cup to the receiver by celluloid tubes, which are almost indestructible and easily cleaned.

Class 109 was a competition for Silver and Bronze Medals for the best sample of Receptacles for delivery of milk in small quantities: returnable (A) and non-returnable (B).

The judges were somewhat disappointed, as they expected something better and cheaper would have been devised for both returnable

and non-returnable milk receptacles. The points were awarded as follows:—

1. Cost	...	...	...	...	...	20
2. Hygienic merit ; lightness and stability	...	...	...	...	...	20
3. Facility in closing and handling	...	...	...	...	...	20
4. If returnable, the easiness of thorough cleansing	...	...	...	...	...	20
5. If of metal, absence of joints and construction so as to admit of retinning	...	...	...	...	...	20
						<hr/> 100

No. 1870, exhibited by the Dairy Supply Co. gained the highest points and was awarded the Silver Medal in Section A. Though more expensive than some of the other tins, it could be retinned, had a double seam bottom, a riveted hinge, with ears and back loop in one piece.

No. 1866, which gained the Bronze Medal, was shown by Messrs. Vipan & Headly. It was strong, simple, but somewhat expensive, and not so easily cleansed as some of the exhibits.

In Section B, No. 1874, a series of wood pulp Milk Cups exhibited by the Dairy Supply Co gained a Bronze Medal. These vessels have a double lid of cardboard and tin, but the judges did not consider them sufficiently durable.

### *Buttermaking Contests.*

The entries here show a slight falling-off, though still as many as can conveniently be accommodated during the Show. Throughout the various sections a very high state of perfection in training was shown, and the competitors proved very even, though a few did not pay sufficient attention to the temperature of the hall. An alteration in the scale of points is strongly advocated by one of the Judges, and it would be well for the Council again to give consideration to this matter.

### *The Milkers' Contests.*

These were again as popular as ever, and the Judge asks that in future more prizes be given, as, with such large entries and with so many of almost equal merit, it is very difficult to do justice to the competitors. The milking pails at present in use were criticised and considered much too big for women milkers.

The class for Men was very large with 72 entries, and it was suggested that for the future this should be divided by excluding from one section the prize-winners of previous years.

## THE MILKING TRIALS, 1913.

By W. ASHCROFT, The Waldrons, Croydon.

THE Milking Trials of 1913 were carried out on the same lines as adopted in previous years.

The standard of points for each breed under which no animal is allotted a prize remained as in 1912, viz. :—

	Points for Cows.
Pedigree Shorthorns ... ..	95
Non-Pedigree Shorthorns ... ..	110
Lincolnshire Red Shorthorns ... ..	100
Jerseys ... ..	95
Guernseys ... ..	85
Ayrshires ... ..	90
Red Polls ... ..	90
South Devons ... ..	100
Kerries ... ..	80
Dexters ... ..	75

The *standard for heifers* was taken at two-thirds the points fixed for cows of the same breed.

The data on which the awards were calculated is as follows :—

One point for every pound of milk yielded per day, taking the average of two days' yield ;

Twenty points for every pound of butter fat contained in the milk, calculated from the analysis ;

Four points for every pound of solids other than fat, similarly calculated ;

One point for every 10 days since calving, deducting the first 40 days, with a maximum of 12 points.

Deductions were made of 10 points for each time the milk fell below the legal standard of 3 per cent. of fat or below 8.5 per cent. of solids other than fat.

It must always be remembered that the calculations are based on the average yield of milk for two days, and are not strictly comparable with the yield of butter in the butter tests which is the result of one day's milk only.

The cows were milked and stripped on Tuesday evening to the satisfaction of the Stewards, and the milk given on the morning and evening of Wednesday and Thursday was weighed and averaged. Samples of both milkings on Wednesday were taken and analysed by the Society's chemist, Mr. F. J. Lloyd, F.C.S., the analysis with the average weight of milk forming the basis on which the calculations were made.

The number of animals that went through the test is shown in the following table and compared with the numbers in 1910, 1911, and 1912.

Cows.		1910.	1911.	1912.	1913.
Pedigree Shorthorns	... ..	11	13	13	24
Non-Pedigree Shorthorns	... ..	16	18	22	10
Lincolnshire Red Shorthorns	... ..	8	7	8	7
Jerseys	... ..	19	16	9	12
Guernseys	... ..	3	1	4	10
Red Polls	... ..	7	6	8	6
Ayrshires	... ..	2	2	7	4
S. Devons	... ..	7	3	6	2
Kerries	... ..	3	6	2	5
		76	72	79	80
HEIFERS.					
Pedigree Shorthorns	... ..	12	10	3	20
Non-Pedigree Shorthorns	... ..	11	7	2	11
Lincolnshire Reds	... ..	6	6	6	5
Red Polls	... ..	7	5	4	9
		36	28	15	45
Goats	... ..	13	21	15	23

A study of the above table shows that whereas the number of cows varies only slightly the number of heifers is three times as great as in 1912 and considerably in excess of 1910 or 1911.

The judges of the Milking Trials would strongly urge upon the Council the advisability of taking some steps towards limiting the number of heifers allowed to exhibit. The capacity of the Hall is limited, and if the heifers are allowed to increase as they have done this year, monopolising some of the best positions in the show and crowding out the cows, the show as an exhibit of milk-producing stock will undoubtedly suffer. No one can possibly pretend that the test of a heifer after her first calf is of anything like the importance as that of a cow arrived at her maturity. The heifer may or may not, in after years, do as well as she first promised, but there is no certainty, and there is no doubt that the first object of the Dairy Show should be to bring together the best and most reliable collection of milk-producing animals that can be found. In the writer's opinion, the proper place for heifers is at the large summer shows where space is, comparatively speaking, unlimited.

There are no striking variations in the milk yielded over that of former years to notice; the calculations for each cow are given in the table at the end of the report, and five other tables may be studied to compare previous results, viz. :—

Table I, which gives the standard for each class, the number of cows tested, the number gaining points above the standard, the average points gained, and the average points gained by those above the standard.

Table II, which gives the average number of points gained in each class for 14 years.

Table III, which gives the highest points gained during the past six years in each class.

Table IV, which gives the average quality and quantity of milk of all the animals competing in each class for six years 1908-1913.

Table V, which gives the number of animals yielding milk deficient in fat or other solids for seven years 1907-1913.

The valuable Challenge Cups which are the chief prizes in the Milking Trials were won as follows:—

The Barham Challenge Cup for the cow gaining the greatest number of points in the Milking Trials, by Mr. F. B. Wilkinson's Non-Pedigree Shorthorn "Sherwood Rose 2nd," with 158 points; not quite so high as the record score last year of 169.5 points, but a very good one. This cow gave just over 7 gallons of milk, showing 3.52 per cent. of fat in the morning, and 4.64 per cent. of fat in the evening; she had been calved 23 days.

The Shirley Challenge Cup for the cow giving the greatest weight of milk, such milk to contain not less than 3 per cent. of fat and 8.5 per cent. of non-fatty solids, was won by the same animal, who, in addition, scored another success in gaining

The Lord Mayor's Champion Cup for the cow gaining the highest points above the standard of her breed.

The Spencer Challenge Cup to the cow gaining the greatest number of points by Inspection, Milking Trial, and Butter Test, was won by Mr. S. Raingill's Non-Pedigree Shorthorn "Ruby," who obtained a total of 232.1 points, made up as follows:—

143.6 points in Milking Trial;  
48.50 points in Butter test;  
40.0 points in Inspection, as 3rd in her class.

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232.1

This cow gave about 5½ gallons of milk with an extraordinary percentage of fat, viz., 5.51 in the morning and 5.69 in the evening, and had been calved 24 days.

Mr. Wilkinson's cow, winner of the first three Challenge Cups mentioned, was Reserve for the Spencer Cup with 210.2 points.

158 points in the Milking Trial;  
27.25 points in the Butter Test;  
25 points in Inspection, as Commended in her class.

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210.2

Taking now the classes seriatim:—

Class 1, Pedigree Shorthorns, if we consider together the number tested and the points gained, was quite one of the best classes of this breed ever seen at the Dairy Show. Twenty-four cows were tested, obtaining an average of 95.2 points, which average, if we exclude an

animal almost dry—and that ought certainly not to have competed—would have been 98·3 points; the number gaining points above the standard was 14 or 58 per cent. of the class, and their points averaged 107·2. In last year's competition, when the number tested was only about half of the above, viz., 13, eight cows gained points above the standard with an average of 108·6.

These figures all point to the attention now being given by breeders to improving the Dairy properties of Shorthorns, and also to the advisability of raising the standard of the breed to 100, from which point it had to be reduced some years ago owing to the poor milking qualities of the animals then exhibited.

The points gained by the first three were respectively 127·6, 121, and 112·4, and six others gained points over 100.

Class 2, Pedigree Shorthorn heifers, also showed improvement, 10 out of the 20 tested gaining points above the standard with an average of 71·9 points. Last year only three competed, and none reached the standard.

Class 3, Non-Pedigree Shorthorns, though rather a small class as compared with other years, only numbering 10, brought out very many good dairy cows, and to the first and second prizes in this class attention has already been drawn as winners of all the four Challenge Cups.

Class 4, Non-Pedigree Shorthorn heifers, in which 11 were tested, obtained an average of 75·2 points, and the average of five above the standard was 95·7 points.

Class 5, Lincolnshire Red Shorthorns, numbering seven, were not quite so good as we have had in former years, though the average points gained were practically the same as last year, viz., 95·7 as against 95·5.

Class 6, Lincolnshire Red Shorthorn heifers, gave pretty much the same results as last year, with an average of 69 points, as against 67·3 for the class.

Class 7, Jerseys, of which 12 went through the test, gave results about on an equality with previous years; half the number obtained points above the standard, with an average of 106, the average for the class being 90·4. The length of time the first and second prizes, "Malmsey" and "Promise," both bred and exhibited by Mr. Smith Barry, had been in milk, is worth noting. "Malmsey" gained 123·1 points, had been in milk 26 weeks, and gave close on 4½ gallons, with an average of 5·63 per cent of fat. "Promise" gained 112·6 points, had been in milk 32 weeks, and gave close on 4 gallons, with an average of 5·8 per cent. of fat.

Class 10, Guernseys, were much better represented than of late, though the amount of milk yielded does not do justice yet to the milking quality of this breed.

Ten cows were tested, of which four gained points above the standard, averaging 91·1, the average for the class being 77·3 points; there was very close competition for first and second honours between Mr. Plumpre's "Donnington Juno" second in Inspection, with 93·8 points, and Mr. Oakey's "Brittleware Ivy" with 93·3 points.

Class 12, Red Polls, were, as usual, very well represented, four out of the six tested gaining points well above the standard, with an average of 115.6. The first prize in the Inspection Class, Mr. K. M. Clark's "Sudbourne Flight," taking first with 120.5 points; the same exhibitor's "Sudbourne Queen 1st," Reserve in the Inspection Class, being placed second with 116.8 points, and his third prize in the Inspection, "Sudbourne Beautiful," third in the Milking Trials, with 113.4 points.

Class 13, Red Poll heifers, numbering nine, were a very even, good milking lot, eight out of the nine gained points above the standard, having an average of 70.4, the average for the class being 68.8. Here again the prize winners in the Inspection Class furnish the winners in the Milking Trials with a slight alteration of the order. Mr. Blundell's "Rendlesham Lady Maud," second in Inspection, coming first, with 81.2 points, Mr. K. M. Clark's "Sudbourne Berry," third in Inspection, second, with 73.4 points, and the Marchioness of Graham's "The League," first in Inspection, third, with almost the same total viz., 73.1 points.

Class 14, Ayrshires, after many years' interval, have at last been well represented. All four animals gained points well above the standard, showing an average of 107.6, with no milk of poor quality, which has been rather frequent in the past amongst cows competing in this breed. Even if we exclude Mr. Ast'ev's "Southfield Annie," the highest scorer, with 130.2 points, disqualified from taking a prize as not being a true bred Ayrshire, the remaining three averaged 100.1 points.

Class 15, S. Devons, were but moderately represented, only two competing, the prize going to Messrs. Page & Whitley's "Sunbeam's Bluebell," with 115.7 points, which is not equal to the average obtained by first-prize winners in this class during the last four years.

Class 16, Kerries, numbering five, contained only two good animals, who gave nearly equal results, viz., 93.7 and 92.3 points.

Goats. There was quite a good milking competition in a well-filled class of goats. Twenty-three were tested, obtaining the respectable average of 13.8 points.

The awards, with points gained, went to the following:—

First Prize, Miss Mortimer's "Wignore Cornflower," Anglo-Swiss, 21.06 points.

Second prize Miss Mortimer's "Cowslip 3rd," Anglo-Swiss, 19.96 points.

Third prize, Miss Page's "Ira Conny," Anglo-Toggenburg, 18.78 points.

Fourth prize, Mrs. Straker's "Leazes Eve," Toggenburg and Anglo-Nubian, 18.53 points.

Reserve, Miss Mortimer's "Wigmore Tansy," Anglo-Nubian, 17.68 points.



TABLE I.—SHOWING THE NUMBER OF COWS COMING UP TO THE STANDARD.

[Cows	Standard	Cows Tested	Above Standard	Average Points Gained	Average Points of Cows above Standard
Shorthorns, Pedigree .. .. .	95	24	14	95.2	107.2
Shorthorn Pedigree Heifers .. .. .	63	20	10	63.2	71.9
Shorthorns, Non-Pedigree .. .. .	110	10	5	117.1	134.8
Shorthorn Non-Pedigree Heifers.. .. .	73	11	5	75.2	95.7
Lincolnshire Reds.. .. .	100	7	3	95.7	112.3
Lincolnshire Red Heifers.. .. .	66	5	3	69.0	79.0
Jersey Cows .. .. .	95	12	6	90.4	106.0
Guernsey Cows .. .. .	85	10	4	77.3	91.0
Red Poll Cows .. .. .	90	6	4	95.5	115.6
Red Poll Heifers.. .. .	60	9	8	68.8	70.4
Ayrshires .. .. .	90	4	4	107.6	107.6
South Devons .. .. .	100	2	1	103.9	115.7
Kerries .. .. .	80	5	2	68.3	93.0
Total .. .. .	—	125	69		

TABLE II.—AVERAGE POINTS GAINED IN THE MILKING TRIALS FOR PAST 14 YEARS.

Year	Shorthorn Pedigree	Shorthorn Pedigree Helpers	Shorthorn Non-Pedigree	Shorthorn Non-Pedigree Helpers	Lincolnshire Red Shorthorn	Lincolnshire Red Helpers	Jerseys	Friesians	Red Poll Cows	Red Poll Helpers	Ayrshires	Dexters	Kettles	South Devon
1913 ..	95.2	63.2	117.1	75.2	95.7	69.0	90.4	77.3	95.5	68.8	107.6	—	68.3	103.9
1912 ..	98.0	40.3	124.4	79.4	95.5	67.3	94.5	71.0	96.3	75.9	79.6	—	93.3	110.6
1911 ..	89.0	61.4	112.2	76.5	103.5	65.9	91.9	88.8	80.2	63.7	54.3	—	67.0	104.1
1910 ..	109.5	—	109.4	—	99.4	—	90.5	77.9	95.5	—	74.6	—	89.1	107.2
1909 ..	97.5	—	108.4	—	101.7	—	88.6	73.3	86.4	—	—	—	70.2	93.7
1908 ..	99.5	—	103.6	—	95.7	—	82.3	80.7	74.1	—	62.6	68.8	74.3	—
1907 ..	94.6	—	102.4	—	103.6	—	86.9	84.6	90.6	—	54.3	70.5	91.1	—
1906 ..	88.0	—	93.2	—	—	—	83.9	83.6	76.5	—	85.4	65.8	81.3	111.5
1905 ..	92.1	—	106.3	—	—	—	93.4	78.1	78.5	—	76.4	—	67.3	—
1904 ..	73.6	—	101.1	—	—	—	91.5	76.1	85.4	—	51.2	62.9	79.5	—
1903 ..	85.1	—	111.8	—	—	—	84.5	66.4	82.8	—	—	—	75.8	—
1902 ..	75.6	—	105.3	—	—	—	77.8	66.4	80.0	—	40.5	71.6	62.0	—
1901 ..	86.0	—	113.9	—	—	—	78.2	77.2	94.0	—	85.7	68.0	82.2	—
1900 ..	72.4	—	108.2	—	—	—	63.4	80.3	87.5	—	—	55.7	71.1	—

TABLE III.—SHOWING THE HIGHEST POINTS GAINED DURING PAST 6 YEARS.

Breeds.	1913.	1912.	1911.	1910.	1909.	1908.
Shorthorns, Pedigree ... ..	127.6	125.6	153.3	136.7	123.9	139.2
Shorthorns, Pedigree Heifers ...	83.6	57.7	76.7	85.7	88.4	74.0
Shorthorns, Non-Pedigree ... ..	158.0	169.5	143.0	138.5	142.7	133.0
Shorthorns, Non-Pedigree Heifers ...	102.1	106.7	108.8	85.1	89.0	88.7
Lincolnshire Reds, Shorthorns ...	114.8	130.4	133.5	124.2	144.4	115.9
Lincolnshire Reds, Heifers ... ..	81.2	89.1	81.1	66.2	—	—
Jerseys ... ..	123.1	117.9	115.4	111.6	129.2	100.7
Guernseys ... ..	93.8	85.0	88.8	82.5	84.7	94.1
Red Polls ... ..	120.5	122.7	120.3	120.0	108.8	93.6
Red Poll Heifers ... ..	81.2	90.8	70.9	79.6	74.5	72.4
Ayrshires ... ..	130.2	90.9	75.7	87.7	—	82.1
Kerries ... ..	93.7	102.8	92.9	100.3	77.4	104.3
South Devons ... ..	115.7	144.8	112.7	135.6	120.9	—

TABLE IV.—QUANTITY AND QUALITY OF MILK, 1908-1913.

Breed	Year	No. of Animal	Average Weight of Milk		Total Weight of Milk		Percentage Composition of Milk				Total Solids	
			Morn.	Even.	Morn.	Even.	Fat		Solids, not Fat		Morn.	Even.
							Morn.	Even.	Morn.	Even.		
Shorthorns, Pedigree	1908	15	24.2	24.0	48.2		3.26	3.88	9.18	8.84	12.44	12.72
	1909	19	23.2	22.1	45.3		3.43	4.27	8.98	8.80	12.41	13.07
	1910	11	26.0	24.0	50.0		3.77	4.25	9.08	9.03	12.85	13.28
	1911	13	23.8	21.5	45.3		3.23	3.75	9.21	8.95	12.44	12.70
	1912	13	24.5	21.8	46.3		3.66	4.01	9.16	9.13	12.82	12.14
	1913	24	24.9	22.9	47.8		3.39	3.67	9.16	8.94	12.45	12.61
Shorthorns, Pedigree (Heifers)	1908	9	16.1	16.6	32.7		2.70	3.36	9.20	8.95	11.90	12.31
	1909	13	14.3	13.4	27.7		3.49	3.74	9.24	9.06	12.73	12.80
	1910	12	16.6	15.2	31.8		3.22	3.74	9.42	9.29	12.64	13.03
	1911	10	16.8	14.9	31.7		3.24	3.41	9.21	9.21	12.45	12.61
	1912	3	12.9	11.3	24.2		3.47	3.13	9.44	9.34	12.81	12.47
	1913	20	14.9	13.9	28.8		3.71	4.16	9.26	9.05	12.97	13.21
Shorthorns, Non-Pedigree Cows	1908	19	26.3	24.9	51.2		3.66	4.00	9.04	8.73	12.70	12.73
	1909	13	27.2	25.6	52.8		3.54	4.37	8.99	8.77	12.53	13.14
	1910	16	27.0	24.7	51.7		3.60	4.08	8.97	8.94	12.57	13.02
	1911	18	29.0	26.2	55.2		3.43	4.36	9.26	8.95	12.69	13.37
	1912	22	31.4	28.3	59.7		3.69	4.29	9.11	8.94	12.80	13.23
	1913	10	29.8	28.6	58.4		3.72	3.92	8.97	8.77	12.69	12.69
Shorthorns, Non-Pedigree (Heifers)	1908	4	17.8	16.9	34.7		3.80	3.74	9.29	9.12	13.09	12.86
	1909	10	18.7	17.6	36.3		3.04	3.69	9.26	9.03	12.30	12.72
	1910	11	16.6	16.0	32.6		3.31	3.72	9.33	9.24	12.64	12.96
	1911	7	19.3	17.7	37.0		3.51	3.72	9.51	9.25	13.03	12.99
	1912	2	19.7	18.6	38.3		3.57	4.31	9.41	9.39	12.98	13.70
	1913	11	19.0	17.4	36.4		3.76	4.16	8.99	8.87	12.75	13.03

## QUANTITY AND QUALITY OF MILK, 1908-1913.—Continued.

Breed	Year	No. of Animals	Average Weight of Milk		Total Weight of Milk	Percentage Composition of Milk							
			Milk			Fat		Solids, not Fat		Total Solids			
			Morn.	Even.		Morn.	Even.	Morn.	Even.	Morn.	Even.		
Lincolnshire Red Shorthorns	1908	9	24.8	23.9	48.7	3.24	3.93	8.84	8.70	12.08	12.63		
	1909	7	25.0	23.5	48.5	3.14	4.59	9.06	8.90	12.20	13.49		
	1910	8	24.1	21.5	45.6	3.60	4.00	9.03	8.96	12.63	12.96		
	1911	7	26.4	23.7	50.1	3.19	4.66	9.05	8.85	12.24	13.51		
	1912	8	24.0	22.2	46.2	3.41	3.96	9.24	9.02	12.65	12.98		
1913	7	26.2	21.4	47.6	3.58	3.48	8.73	8.74	12.31	12.22			
Lincolnshire Red Heifers	1911	6	16.8	15.5	32.3	3.28	3.70	9.32	9.33	12.60	13.03		
	1912	6	16.6	15.6	32.2	3.67	3.75	9.18	9.03	12.85	12.78		
	1913	5	18.5	16.8	35.3	3.51	3.74	9.09	9.00	12.60	12.74		
	1908	16	17.4	16.8	34.2	4.07	4.91	9.32	8.99	13.39	13.90		
	1909	23	17.7	16.6	34.3	4.85	5.76	9.44	9.09	14.29	14.85		
Jerseys	1910	19	18.6	16.9	34.5	5.15	5.66	9.17	9.08	14.32	14.74		
	1911	16	19.6	17.3	36.9	4.65	5.31	9.24	9.06	13.89	14.37		
	1912	9	20.2	17.3	37.5	4.40	5.39	9.17	9.03	13.57	14.42		
	1913	12	18.4	16.6	35.0	4.53	5.34	9.21	9.01	13.74	14.35		
	1908	5	17.5	16.1	33.6	4.49	4.88	9.08	8.76	13.57	13.64		
Guernseys	1909	6	16.0	13.3	29.3	4.81	5.08	9.40	9.11	14.21	14.19		
	1910	3	17.4	14.6	32.0	4.11	4.94	9.26	9.12	13.37	14.06		
	1911	1	18.7	15.3	34.0	4.16	4.70	9.32	9.46	13.48	14.16		
	1912	4	15.9	14.1	30.0	4.47	5.24	9.02	8.91	13.49	14.15		
	1913	10	16.1	13.6	29.7	4.72	5.35	9.30	9.17	14.02	14.52		
Red Poll Cows	1908	9	18.6	17.9	36.5	3.44	3.56	9.20	8.98	12.64	12.54		
	1909	8	21.0	19.6	40.6	3.36	3.86	9.17	9.06	12.53	12.91		
	1910	7	22.3	19.1	41.4	3.75	4.14	9.21	9.14	12.96	13.28		
	1911	6	19.9	17.9	37.8	3.29	4.15	9.20	9.08	12.49	13.23		
	1912	8	24.9	21.2	46.1	3.50	3.65	9.13	9.09	12.63	12.74		
1913	6	26.4	23.0	49.4	3.14	3.58	8.96	8.69	12.10	12.27			

## QUANTITY AND QUALITY OF MILK, 1908-1913.—Continued.

Breed	Year	No. of Animals	Average Weight of Milk		Total Weight of Milk	Percentage Composition of Milk							
			Morn.	Even.		Fat		Solids not Fat		Total Solids			
						Morn.	Even.	Morn.	Even.	Morn.	Even.		
Red Poll Heifers	{	1908	4	14.6	13.8	28.4	3.53	3.57	9.25	9.16	12.78	12.73	
		1909	7	13.7	12.5	26.2	4.04	3.87	9.42	9.31	13.46	13.18	
		1910	7	17.2	15.6	32.8	3.56	4.12	9.50	9.39	13.06	13.51	
		1911	5	15.5	14.4	29.9	3.66	4.30	9.30	9.32	12.96	13.63	
		1912	4	17.8	16.3	34.1	3.95	4.00	9.49	9.47	13.45	13.47	
	1913	9	16.3	14.7	31.0	3.80	4.02	9.34	9.05	13.14	13.07		
Ayrshires Cows a	{	1908	6	20.2	19.6	39.8	2.71	3.55	8.82	8.52	11.53	12.07	
		1910	2	18.8	19.3	38.1	3.31	3.68	8.64	8.47	11.95	12.15	
		1911	2	17.4	17.4	34.8	2.72	3.38	8.71	8.59	10.93	11.97	
		1912	7	21.5	19.2	40.7	3.48	3.75	9.28	9.10	12.76	12.85	
		1913	4	25.3	22.5	47.8	4.15	4.34	9.57	9.27	13.72	13.61	
South Devons	{	1909	5	20.3	19.8	40.1	3.80	4.51	9.17	8.94	12.97	13.45	
		1910	7	26.2	24.9	51.1	3.44	3.88	9.25	9.04	12.69	12.92	
		1911	3	26.8	23.0	49.8	3.21	3.62	9.23	9.09	12.44	12.72	
		1912	6	25.1	22.9	48.0	3.86	4.14	9.36	9.18	13.22	13.32	
		1913	2	25.1	21.8	46.9	4.09	3.80	9.19	9.06	13.28	12.86	
Kerry Cows . .	{	1908	6	19.0	15.8	34.8	3.81	3.68	9.09	8.84	12.90	12.52	
		1909	2	15.1	14.3	20.4	3.93	5.14	9.27	8.79	13.20	13.93	
		1910	3	19.9	19.2	39.1	4.04	4.81	9.06	8.86	13.10	13.67	
		1911	6	16.9	14.7	31.6	3.48	3.92	9.11	9.04	12.59	12.97	
		1912	2	21.3	19.9	41.2	3.81	5.03	9.32	9.21	13.13	14.24	
	1913	5	16.9	14.3	31.2	3.97	4.18	9.24	9.24	13.21	13.42		

a See remarks on page 125 on this class.

TABLE V.—NUMBER OF ANIMALS YIELDING MILK DEFICIENT IN FAT OR OTHER SOLIDS.

	Less than 3 per cent. of Fat							Less than 8.5 per cent. of other Solids						
	1913	1912	1911	1910	1909	1908	1907	1913	1912	1911	1910	1909	1908	1907
<b>Cows.</b>														
Shorthorns, Pedigree ..	6	3	5	1	2	4	8	3	0	1	0	1	2	2
Shorthorns, Non-Pedigree	3	5	6	2	3	4	8	3	2	3	1	4	4	0
Shorthorns, Lincoln Reds	0	2	4	1	3	4	3	1	0	0	0	0	1	0
Jerseys ..	0	0	1	0	1	1	0	0	0	1	2	0	0	0
Guernseys ..	0	0	0	0	0	0	0	0	0	0	0	0	1	0
Red Poll ..	2	3	2	0	2	2	1	1	0	0	0	0	1	0
Kerries ..	0	0	0	0	0	0	0	0	0	1	0	0	1	0
South Devons	0	0	1	2	0	0	0	0	0	0	1	0	0	0
Ayrshires ..	0	2	1	0	0	0	0	0	1	1	0	0	0	0
<b>HEIFERS.</b>														
Shorthorns, Pedigree ..	1	2	4	4	4	6	2	0	0	0	0	2	1	1
Shorthorns, Non-Pedigree	1	1	2	5	4	0	3	2	0	0	0	0	0	0
Shorthorns, Lincoln Reds	2	1	1	3	0	0	0	1	0	0	0	0	0	0
Red Polls ..	0	0	1	1	0	1	2	0	0	0	0	0	0	1
<b>Total ..</b>	<b>15</b>	<b>19</b>	<b>28</b>	<b>19</b>	<b>19</b>	<b>22</b>	<b>27</b>	<b>11</b>	<b>3</b>	<b>7</b>	<b>4</b>	<b>7</b>	<b>11</b>	<b>4</b>

CLASS I.—SHORTHORN COWS.

Number ... Name ...	...	...	...	1 Waterloo Lily 2nd.	5 Lady Beattie 13th.	6 Diadem.	7 Red Rosey 4th.
Born ...	...	...	...	Nov. 1, 1907.	April 12, 1905.	June 22, 1906.	Mar. 10, 1904.
Number of Calves ...	...	...	...	Aug. 27.	Aug. 20.	July 6.	June 18.
Last Calved ...	...	...	...	56	63	108	126
Days since Calving ...	...	...	...				
Weight of Milk, 1st day ...	...	...	...	Morn Even	Morn Even	Morn Even	Morn Even
Weight of Milk, 2nd day ...	...	...	...	26.8 25.1	20.7 15.6	24.3 21.3	10.8 10.9
Total ...	...	...	...	26.4 28.1	22.5 16.2	25.8 29.7	13.3 11.9
Average ...	...	...	...	53.2 53.2	43.2 31.8	50.1 42.0	24.1 22.8
Percentage { Fat ...	...	...	...	26.6 26.6	21.6 15.9	25.0 21.0	12.0 11.4
Composition of { Solids other than Fat	...	...	...	3.12 3.97	6.08 3.75	3.32 3.35	2.94 3.41
the Milk. {	...	...	...	8.56 8.31	8.74 9.09	9.18 9.05	8.32 8.00
Actual weight of Fat, in lbs. ...	...	...	...	11.68 12.28	14.82 12.84	12.50 12.40	11.26 11.44
Calculation of Points multiply by 20	...	...	...	.83 1.05	1.31 .60	.83 .70	.35 .39
Actual weight of Solids other than Fat, in lbs.	...	...	...	16.6 21.0	26.2 12.0	16.6 14.0	7.0 7.8
Calculation of Points multiply by 4	...	...	...	2.27 2.20	1.89 1.45	2.3 1.90	1.0 .91
{ For time since Calving ...	...	...	...	9.08 8.80	7.56 5.80	9.2 7.6	4.0 3.64
{ For weight of Milk ...	...	...	...	1.6	2.30	6.8	8.6
{ For weight of Fat ...	...	...	...	53.2	37.5	46.0	23.4
{ For weight of Solids other than Fat	...	...	...	37.6	38.2	30.6	14.8
Total ...	...	...	...	17.9	13.4	16.8	7.6
Deductions ...	...	...	...	110.3	91.4	100.2	54.4
Points gained	...	...	...	10.0	—	—	30.0
Remarks and Awards ...	...	...	...	100.3	91.4	100.2	24.4
	...	...	...	High Commendation.	High Commendation.	High Commendation.	



CLASS 1.—SHORTHORN COWS—Continued.

Number ...	...	...	...	12	16	17	18
Name ...	...	...	...	Rank—Longford Calendar	Mary of Heggle 2nd.	Greenleaf 32nd.	Greenleaf 34th.
Born ...	...	...	...	May 17, 1907.	Jan. 1, 1904.	Jan. 24, 1906.	Nov. 12, 1907.
Number of Calves ...	...	...	...	—	7	4	3
Last Calved ...	...	...	...	Oct. 3.	Aug. 4.	Sept. 28.	Sept. 13.
Days since Calving ...	...	...	...	19	79	24	39
Weight of Milk, 1st day	...	...	...	Morn	Morn	Morn	Morn
Weight of Milk, 2nd day	...	...	...	Even	Even	Even	Even
Total	...	...	...	23.8	18.2	27.1	17.9
Average	...	...	...	25.2	24.6	36.4	19.0
Percentage (Fat ...)	...	...	...	49.0	42.8	63.5	36.9
Composition of Solids other than Fat	...	...	...	24.5	21.4	31.7	18.4
the Milk. (Solids)	...	...	...	4.44	2.88	3.81	3.85
Actual weight of Fat, in lbs. ...	...	...	...	9.10	9.42	9.33	8.81
Calculation of Points multiply by 20	...	...	...	13.54	12.30	13.14	12.66
Actual weight of Solids other than Fat, in lbs.	...	...	...	1.09	.62	1.21	.71
Calculation of Points multiply by 4	...	...	...	21.8	12.4	24.2	14.2
Actual weight of Solids other than Fat, in lbs.	...	...	...	2.22	2.01	2.96	1.62
Calculation of Points multiply by 4	...	...	...	8.88	8.04	11.84	6.48
Points	...	...	...	47.4	3.9	—	—
For time since Calving	...	...	...	42.0	42.7	61.1	37.3
For weight of Milk	...	...	...	17.4	25.6	44.0	27.2
For weight of Fat	...	...	...	106.8	15.6	22.5	13.2
For weight of Solids other than Fat	...	...	...	—	87.8	127.6	77.9
Total	...	...	...	106.8	10.0	—	—
Deductions	...	...	...	106.8	77.8	127.6	77.9
Points gained	...	...	...	—	—	—	—
Remarks and Awards ...	...	...	...	High	1st Prize.	1st Prize.	1st Prize.
	...	...	...	Commendation.	Reserve for Lord Mayor's Cup and Shorthorn Society's Prize	Reserve for Lord Mayor's Cup and Shorthorn Society's Prize	Reserve for Lord Mayor's Cup and Shorthorn Society's Prize

## CLASS I.—SHORTHORN COWS—Continued.

Number ...	...	...	...	19 Rose 14th.	22 Hambleton (Oxford Duchess.	23 Waterloo Belle.	24 Lady Clara.
Name ...	...	...	...	Nov. 17, 1907. 3	Mar. 25, 1904. Aug. 26. 57	June 12, 1904. Aug. 28. 53	Nov. 10, 1905. Sept. 18. 34
Born ...	...	...	...	...	...	...	...
Number of Calves ...	...	...	...	...	...	...	...
Last Calved ...	...	...	...	...	...	...	...
Days since Calving ...	...	...	...	...	...	...	...
Weight of Milk, 1st day	...	...	...	Morn Even	Morn Even	Morn Even	Morn Even
Weight of milk, 2nd day	...	...	...	33.3 31.7	28.1 25.0	29.2 26.8	30.7 34.0
Total	...	...	...	40.0 32.8	31.1 24.7	34.5 27.6	34.9 35.0
Average ...	...	...	...	73.3 64.5	50.2 49.7	63.7 54.4	65.6 69.0
Percentage	...	...	...	36.6 32.2	29.6 24.8	31.8 27.2	32.8 34.5
Composition of { Fat ...	...	...	...	2.23 3.00	3.00 3.05	1.89 2.07	2.57 2.90
the Milk. { Solids other than Fat	...	...	...	9.01 8.98	8.64 8.69	8.97 9.03	8.83 8.94
Actual weight of Fat, in lbs. ...	...	...	...	11.24 11.98	11.64 11.74	10.86 11.10	11.40 11.84
Calculation of Points multiply by 20	...	...	...	.82 .97	.89 .76	.6 .56	.84 1.00
Actual weight of Solids other than Fat, in lbs.	...	...	...	16.4 19.4	17.8 15.2	12.0 11.2	16.8 20.0
Calculation of Points multiply by 4 ...	...	...	...	3.3 2.90	2.56 2.16	2.88 2.45	2.9 3.10
Points { For time since Calving	...	...	...	1.6	1.7	1.5	—
{ For weight of Milk ...	...	...	...	68.8	54.4	59.0	67.3
{ For weight of Fat ...	...	...	...	35.8	33.0	23.2	36.8
{ For weight of Solids other than Fat	...	...	...	24.8	18.9	21.3	24.0
Total ...	...	...	...	131.0	108.0	105.0	128.1
Deductions ...	...	...	...	10.0	—	20.0	20.0
Points gained	...	...	...	121.0	108.0	85.0	108.1
Remarks and Awards ...	...	...	...	2nd Prize.	High Commendation.	—	Reserve.
	...	...	...	Reserve Shorthorn Sec'y Prize (equal with 24 & 25)	Reserve Shorthorn Sec'y Prize (equal with 19 & 23)	—	—





CLASS I.—SHORTHORN COWS—Continued.

Number ...	...	37	38	39	41
Name ...	...	Carrie Exth.	Rollbright Bridget.	Laurestina	Honey Louree Snowdrop
Born ...	...	Aug. 3, 1908.	Feb. 15, 1910.	Aug. 27, 1904.	June 30, 1907.
Number of Calves ...	...	...	...	...	...
Last Calved ...	...	Aug. 4.	Oct. 3.	May 28.	Sept. 30.
Days since Calving ...	...	79	17	147	22
Weight of Milk, 1st day	...	Morn Even	Morn Even	Morn Even	Morn Even
Weight of Milk, 2nd day	...	20.5 19.4	17.7 16.2	19.5 16.0	22.2 21.3
Total ...	...	21.8 18.0	16.0 17.6	19.1 16.6	22.0 21.6
Average ...	...	42.3 37.4	33.7 33.8	38.6 32.6	44.2 42.9
Percentage (Fat ...	...	21.1 18.7	16.8 16.9	19.3 16.3	22.1 21.4
Composition of Solids other than Fat	...	3.32 3.92	4.04 4.32	3.86 4.24	3.39 4.52
the Milk. (Solids ...	...	9.32 9.14	9.12 9.22	9.08 9.16	9.49 9.24
Actual weight of Fat, in lbs. ...	...	12.64 13.06	13.16 13.54	12.94 13.40	12.88 13.76
Calculation of Points multiply by 20	...	7.7 .73	.68 .73	.75 .69	.75 .97
Actual weight of Solids other than Fat, in lbs.	...	14.0 14.6	13.6 14.6	15.0 13.8	15.0 19.4
Calculation of Points multiply by 4 ...	...	1.97 1.70	1.53 1.56	1.75 1.50	2.1 1.98
{ For time since Calving ...	...	7.88 6.80	6.12 6.24	7.00 6.00	8.4 7.92
Points { For weight of Milk ...	...	3.9	—	10.7	—
{ For weight of Fat ...	...	39.8	33.7	35.6	43.5
{ For weight of Solids other than Fat	...	28.6	28.2	28.8	34.4
Total ...	...	14.7	12.4	13.0	16.3
Deductions ...	...	87.0	74.3	88.1	94.2
Points gained	...	87.0	74.3	88.1	94.2
Remarks and Awards ...	...	...	...	...	...



CLASS 2.—SHORTHORN HEIFERS (NOT EXCEEDING THREE YEARS OLD)—Continued.

Number Name	...	...	...	49 C/o Kewham Farm Mar. 25, 1911. Oct. 4, 18	50 Puddington Blossom. April 26, 1911. July 1, 113	52 Puddington Beauty. April 1, 1911. July 31, 83	53 Puddington Wild Eyes June 4, 1911. Sept. 26 26
Born	...	...	...	...	...	...	...
Number of Calves	...	...	...	...	...	...	...
Last Calved	...	...	...	...	...	...	...
Days since Calving	...	...	...	...	...	...	...
Weight of Milk, 1st day	...	...	...	Morn Even	Morn Even	Morn Even	Morn Even
Weight of Milk, 2nd day	...	...	...	14.1 13.5	11.8 10.3	12.3 11.7	12.9 14.2
Total	...	...	...	14.7 12.4	10.5 9.8	11.7 11.0	15.5 13.9
Average	...	...	...	28.8 25.9	22.3 20.1	24.0 22.7	28.4 28.1
Percentage { Fat ...	...	...	...	14.4 12.9	11.1 10.0	12.0 11.3	14.2 14.0
Composition of { Solids other than Fat	...	...	...	4.64 4.43	3.49 4.62	4.15 4.32	3.26 4.40
the Milk. { Solids ...	...	...	...	9.70 9.47	10.19 9.24	9.39 9.18	9.24 8.94
Actual weight of Fat, in lbs. ...	...	...	...	14.34 13.90	13.68 13.86	13.54 13.50	12.50 13.34
Calculation of Points multiply by 20	...	...	...	.67 .57	.38 .46	.5 .49	.46 .61
Actual weight of Solids other than Fat, in lbs.	...	...	...	13.4 11.4	7.6 9.2	10.0 9.8	9.2 12.2
Calculation of Points multiply by 4 ...	...	...	...	1.4 1.22	1.1 .92	1.13 1.04	1.31 1.25
Points { For time since Calving For weight of Milk ... For weight of Fat ... For weight of Solids other than Fat Total Deductions Points gained	...	...	...	5.6 4.88	4.4 3.68	4.52 4.16	5.24 5.0
	...	...	...	—	7.3	4.3	—
	...	...	...	27.3	21.1	23.3	28.2
	...	...	...	24.8	16.8	19.8	21.4
	...	...	...	10.5	8.1	8.7	10.2
...	...	...	...	62.6	53.3	56.1	59.8
...	...	...	...	—	—	—	—
...	...	...	...	62.6	53.3	56.1	59.8
Remarks and Awards ...	...	...	...	...	...	...	...

CLASS 2.—SHORTHORN HEIFERS (NOT EXCEEDING THREE YEARS OLD)—Continued.

Number ...	...	...	54	55	56	57
Name ...	...	...	Spotless 31st.	Rose 36th	Parling 31st.	Kataleen 31st.
Born ...	...	...	Sept. 3, 1910.	Nov. 8, 1910.	Mar. 8, 1911.	Jan. 7, 1911.
Number of Calves ...	...	...	...	...	1	...
Last Calved ...	...	...	May 21.	Sept. 25.	Sept. 12.	Sept. 12.
Days since Calving ...	...	...	154	27	40	40
Weight of Milk, 1st day	...	...	Morn Even	Morn Even	Morn Even	Morn Even
Weight of Milk, 2nd day	...	...	16.5 15.0	18.0 15.8	16.9 14.7	17.6 14.9
Total	...	...	18.5 14.7	18.8 15.3	16.6 13.0	17.0 14.5
Average	...	...	35.0 29.7	36.8 31.1	33.5 27.7	34.6 29.4
Percentage { Fat ...	...	...	17.5 14.8	18.4 15.5	16.7 13.8	17.3 14.7
Composition of { Solids other than Fat	...	...	3.48 3.65	4.12 4.55	3.88 4.20	3.72 3.44
the Milk. { Solids ...	...	...	9.54 9.41	9.14 8.95	8.62 8.60	8.88 9.00
Actual weight of Fat, in lbs. ...	...	...	13.02 13.06	13.26 13.50	12.50 12.80	12.60 12.44
Calculation of Points multiply by 20	...	...	.61 .54	.76 .70	.65 .58	.64 .50
Actual weight of Solids other than Fat, in lbs.	...	...	12.2 10.8	15.2 14.0	13.0 11.6	12.8 10.0
Calculation of Points multiply by 4 ...	...	...	1.67 1.40	1.68 1.39	1.44 1.18	1.53 1.32
Points { For time since Calving	...	...	6.68 5.6	6.72 5.56	5.76 4.72	6.12 5.28
{ For weight of Milk ...	...	...	11.4	...	...	...
{ For weight of Fat ...	...	...	32.3	33.9	30.5	32.0
{ For weight of Solids other than Fat	...	...	23.0	29.2	24.6	22.8
Total	...	...	12.3	12.3	10.5	11.4
Deductions	...	...	79.0	75.4	65.6	66.2
Points gained	...	...	...	...	...	...
Remarks and Awards ...	...	...	79.0	75.4	65.6	66.2
2nd Prize.	...	...	...	...	...	...
3rd Prize.	...	...	...	...	...	...
High Commendation.	...	...	...	...	...	...
High Commendation.	...	...	...	...	...	...



CLASS 2.—SHORTHORN HEIFERS (NOT EXCEEDING THREE YEARS OLD)—Continued.

Number ...	...	...	58	59	61	63
Name ...	...	...	Lorna Doone.	Roan Duchess.	Kingshorpe Elegance. 7th.	Majorie.
Born ...	...	...	Feb. 10, 1911.	Sept. 16, 1910.	Nov. 25, 1910.	Dec. 10, 1910.
Number of Calves ...	...	...	—	1	—	—
Last Calved ...	...	...	Sept. 18.	Sept. 23.	Aug. 7.	Sept. 21.
Days since Calving ...	...	...	34	29	76	31
Weight of Milk, 1st day	...	...	Morn Even	Morn Even	Morn Even	Morn Even
Weight of Milk, 2nd day	...	...	20-9 19-3	16-6 15-9	13-0 12-8	17-4 16-3
Total	...	...	22-2 20-8	14-2 15-9	12-4 14-8	17-0 14-0
Average	...	...	43-1 40-1	30-8 31-8	25-4 27-6	34-4 30-3
Percentage { Fat ...	...	...	21-5 20-0	15-4 15-9	12-7 13-8	17-2 15-1
Composition of { Solids other than Fat	...	...	3-24 3-32	3-68 3-84	4-67 5-44	3-82 4-44
the MILK. { Solids ...	...	...	8-96 8-98	9-32 9-36	9-43 9-12	9-28 9-18
Actual weight of Fat, in lbs. ...	...	...	12-20 12-30	13-00 13-20	14-10 14-36	13-10 13-62
Calculation of Points multiply by 20	...	...	7-66	5-7 6-1	5-9 7-5	6-6 6-7
Actual weight of Solids other than Fat, in lbs.	...	...	14-0 13-2	11-4 12-2	11-8 15-0	13-2 13-4
Calculation of Points multiply by 4	...	...	1-92 1-80	1-43 1-50	1-2 1-26	1-58 1-38
Points { For time since Calving ...	...	...	7-68 7-2	5-72 6-0	4-8 5-04	6-32 5-52
{ For weight of Milk ...	...	...	—	—	3-6	—
{ For weight of Fat ...	...	...	41-5	31-3	26-5	32-3
{ For weight of Solids other than Fat	...	...	27-2	23-6	26-8	26-6
Total	...	...	14-9	11-7	9-8	11-8
Deductions	...	...	83-6	66-6	66-7	70-7
Points gained	...	...	—	—	—	—
Remarks and Awards ...	...	...	83-6	66-6	66-7	70-7
	...	...	1st Prize.	High Commendation.	High Commendation.	Reserve.

CLASS 2.—SHORTHORN HEIFERS (NOT EXCEEDING THREE YEARS OLD).—(continued.)

Number	...	...	65	66	67	68
Name	...	...	Canab. Gwynne	Ruth 2nd.	Rosal Miss 2nd.	Lacy Ringlet 2nd
Born	...	...	Jan. 15, 1911.	Sept. 2, 1910.	Dec. 16, 1910.	Sept. 6, 1910.
First Calved	...	...	Sept. 30	Sept. 4	Aug. 4.	Aug. 26.
Days since Calving	...	...	22	48	79	57
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Weight of Milk, 1st day	...	...	Morn	Even	Morn	Even
Weight of Milk, 2nd day	...	...	17.5	16.9	11.3	11.9
Total	...	...	19.4	16.5	10.4	12.2
Average	...	...	36.9	33.4	21.7	24.1
<hr/>						
Percentage Fat	...	...	18.4	16.7	10.2	9.4
Composition of the Milk.	...	...	3.66	3.88	3.73	4.27
Actual weight of Fat, in lbs.	...	...	9.30	9.42	9.31	8.87
Calculation of Points multiply by 20	...	...	12.96	12.90	13.04	13.14
<hr/>						
Actual weight of Solids other than Fat, in lbs.	...	...	67	65	53	66
Calculation of Points multiply by 4	...	...	13.4	13.0	10.6	13.2
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Actual weight of Solids other than Fat, in lbs.	...	...	1.7	1.50	1.0	1.10
Calculation of Points multiply by 4	...	...	6.8	6.0	4.0	4.4
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Points	...	...	35.1	19.6	3.9	1.7
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For time since Calving	...	...	26.4	15.6	23.8	25.8
For weight of Fat	...	...	12.8	7.1	8.4	19.0
For weight of Solids other than Fat	...	...	74.3	43.1	58.9	8.9
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Total	...	...	74.3	43.1	58.9	55.4
Deductions	...	...	74.3	43.1	58.9	55.4
Points gained	...	...	4th Prize.	...	...	...
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Remarks and Awards	...	...	...	...	...	...

CLASS 8.—SHORTHORN COWS (NOT ELIGIBLE FOR CLASS 1).

Number ...	...	...	72	73	77	80
Name ...	...	...	Milkmaid.	Bertha 13th.	Primrose.	Southfield Red Rose.
Born ...	...	...	Unknown.	May 28, 1904.	1904.	1904.
Number of Calves ...	...	...	...	5	7	5
Last Calved ...	...	...	Oct. 4.	Sept. 5.	Sept. 3.	Oct. 5.
Days since Calving ...	...	...	18	47	49	17
Weight of Milk, 1st day ...	...	...	Morn Even	Morn Even	Morn Even	Morn Even
Weight of Milk, 2nd day ...	...	...	23.1 21.4	25.1 23.3	34.4 28.4	20.9 23.0
Total ...	...	...	26.2 23.1	26.5 21.7	36.8 32.7	23.0 21.4
Average ...	...	...	49.3 44.5	51.6 45.0	71.2 61.0	43.9 44.4
Percentage { Fat ...	...	...	24.6 22.2	25.8 22.5	35.6 30.5	21.9 22.2
Composition of { Solids other than Fat	...	...	3.61 4.07	3.72 4.07	3.39 3.00	4.45 5.07
the Milk. ...	...	...	8.99 8.83	8.18 8.33	9.17 9.12	9.15 9.03
Actual weight of Fat, in lbs. ...	...	...	12.60 12.90	11.90 12.40	12.56 12.12	13.60 14.10
Calculation of Points multiply by 20	...	...	.89 .90	.96 .91	1.21 .92	.98 1.12
Actual weight of Solids other than Fat, in lbs.	...	...	17.8 18.0	19.2 18.2	24.2 18.4	19.6 22.4
Calculation of Points multiply by 4	...	...	2.21 1.96	2.10 1.87	3.26 2.78	2.00 2.00
Points { For time since Calving ...	...	...	8.84 7.84	8.40 7.48	13.04 11.12	8.00 8.00
{ For weight of Milk ...	...	...	...	.7	.9	...
{ For weight of Fat ...	...	...	46.8	48.3	66.1	44.1
{ For weight of Solids other than Fat	...	...	35.8	37.4	42.6	42.0
Total ...	...	...	16.7	15.9	24.2	16.0
Deductions ...	...	...	99.3	102.3	133.8	102.1
Points gained ...	...	...	20.0	20.0	...	...
Remarks and Awards ...	...	...	99.3	82.3	133.8	102.1
	...	...			3rd Prize.	
	...	...			Reserve Shirley	
	...	...			Cup.	

CLASS 3.—SHORTHORN COWS (NOT ELIGIBLE FOR CLASS 1).—Continued.

Number ...	...	...	...	81	83	87	91
Name ...	...	...	...	Southfield Dora	Ruby	Duchess	Silverton Fill roll.
Born ...	...	...	...	1907.	1908.	Unknown.	19 6.
Number of Calves	...	...	...	3	Sept. 28.	Sept. 20.	3
Last Calved ...	...	...	...	31	24	32	20
Days since Calving	...	...	...				
Weight of Milk, 1st day	...	...	...	Morn Even	Morn Even	Morn Even	Morn Even
Weight of Milk, 2nd day	...	...	...	34.2 31.0	30.9 28.6	31.6 32.1	33.1 31.6
Total	...	...	...	33.4 28.7	18.7 37.3	34.1 31.3	34.5 29.7
Average ...	...	...	...	67.6 59.7	49.6 65.9	65.7 63.4	67.6 61.3
Percentage (Fat ...	...	...	...	33.8 29.8	24.8 32.9	32.8 31.7	33.8 30.6
Composition of Solids other than Fat	...	...	...	4.06 3.60	5.51 5.69	2.97 3.52	3.03 2.85
the Milk. (Solids	...	...	...	8.80 8.46	8.89 8.87	8.63 8.44	9.17 9.11
Actual weight of Fat, in lbs. ...	...	...	...	12.86 12.06	14.40 14.56	11.60 11.96	12.20 11.96
Calculation of Points multiply by 20	...	...	...	1.28 1.07	1.37 1.90	.97 1.12	1.02 .87
Actual weight of Solids other than Fat, in lbs.	...	...	...	25.6 21.4	27.4 38.0	19.4 22.4	20.4 17.4
Calculation of Points multiply by 4	...	...	...	2.98 2.52	2.20 2.92	2.82 2.68	3.10 2.80
Points	...	...	...	11.92 10.08	8.80 11.68	11.28 10.72	12.40 11.20
{ For time since Calving	...	...	...	63.6	57.7	64.5	64.4
{ For weight of Milk ...	...	...	...	47.0	65.4	41.8	37.8
{ For weight of Fat ...	...	...	...	22.0	20.5	22.0	23.6
{ For weight of Solids other than Fat	...	...	...	132.6	143.6	128.3	125.8
Total ...	...	...	...	10.0	—	20.0	10.0
Deductions ...	...	...	...	122.6	143.6	108.3	115.8
Points gained	...	...	...	Reserve.	2nd Prize.	—	High
Remarks and Awards ...	...	...	...	...	Special Challenge Cup	...	Commendation.
	...	...	...	...	and Reserve Batham Cup	...	...

CLASS 3.—SHORTHORN COWS (NOT ELIGIBLE FOR CLASS 1).—Continued.

Number ...	...	...	...	93	94
Name ...	...	...	...	Silverton Mildred	Sharnood Rose 2nd
Born ...	...	...	...	1907.	Unknown.
Number of Calves	...	...	...	3	—
Last Calved	...	...	...	June 23.	Sept. 29.
Days since Calving	...	...	...	121	23
Weight of Milk, 1st day	...	...	...	Morn	Morn
Weight of Milk, 2nd day	...	...	...	Even	Even
Total	...	...	...	26.1	37.2
Average ...	...	...	...	27.0	33.9
...	...	...	...	30.0	35.9
...	...	...	...	28.6	37.7
...	...	...	...	56.1	73.1
...	...	...	...	55.6	71.6
...	...	...	...	28.0	36.5
...	...	...	...	27.8	35.8
Percentage { Fat ...	...	...	...	3.03	3.52
Composition of { Solids other than Fat	...	...	...	2.72	4.64
the Milk. { Solids	...	...	...	9.17	9.54
Actual weight of Fat, in lbs. ...	...	...	...	8.58	8.86
...	...	...	...	12.20	13.06
...	...	...	...	11.30	13.60
...	...	...	...	.85	1.28
...	...	...	...	.75	1.67
Calculation of Points multiply by 20	...	...	...	17.0	25.6
...	...	...	...	15.0	33.4
Actual weight of Solids other than Fat, in lbs.	...	...	...	2.56	3.48
Calculation of Points multiply by 4	...	...	...	2.38	3.20
...	...	...	...	10.24	13.92
...	...	...	...	9.52	12.80
Points { For time since Calving	...	...	...	8.1	—
{ For weight of Milk	...	...	...	55.8	72.3
{ For weight of Fat	...	...	...	32.0	59.0
{ For weight of Solids other than Fat	...	...	...	19.8	26.7
Total ...	...	...	...	115.7	158.0
Deductions	...	...	...	10.0	—
Points gained	...	...	...	105.7	158.0
Remarks and Awards	...	...	...	1st Prize.	...

CLASS 4.—SHORTHORN HEIFERS (NOT EXCEEDING THREE YEARS).

Number ...	...	95	97	100	102
Name ...	...	Filkins 18th.	Southfield Belle.	Rose.	Princess 2nd.
Born ...	...	Mar. 8, 1911.	Oct. 20, 1910.	2 yrs. 10 mos.	June 7, 1911.
Number of Calves ...	...	Sept. 22.	Oct. 6.	Sept. 1.	Sept. 6.
Last Calved ...	...	30	16	51	46
Days since Calving ...	...	...	...	...	...
Weight of Milk, 1st day ...	...	Morn Even	Morn Even	Morn Even	Morn Even
Weight of Milk, 2nd day ...	...	14.3 14.8	21.9 20.0	22.0 22.9	23.4 21.9
Total ...	...	14.0 14.2	24.0 20.1	23.2 19.7	25.0 22.3
Average ...	...	28.3 29.0	45.9 40.1	45.2 42.6	48.4 44.2
...	...	14.1 14.5	22.9 20.0	22.6 21.3	24.2 22.1
Percentage { Fat ...	...	3.40 3.39	5.02 5.05	3.22 4.24	3.82 4.26
Composition of { Solids other than Fat	...	9.04 9.01	9.32 9.35	9.48 9.16	9.12 9.14
the Milk. { Solids ...	...	12.44 12.40	14.34 14.40	12.70 13.40	12.94 13.40
Actual weight of Fat, in lbs. ...	...	.48 .49	1.15 1.01	.73 .90	.93 .94
Calculation of Points multiply by 20 ...	...	9.6 9.8	23.0 20.2	14.6 18.0	18.6 18.8
Actual weight of Solids other than Fat, in lbs. ...	...	1.27 1.31	2.13 1.87	2.14 1.95	2.20 2.01
Calculation of Points multiply by 4 ...	...	5.08 5.24	8.52 7.48	8.56 7.80	8.80 8.04
For time since Calving ...	...	...	...	1.1	.6
For weight of Milk ...	...	28.6	42.9	43.9	46.3
For weight of Fat ...	...	19.4	43.2	32.6	37.4
For weight of Solids other than Fat ...	...	10.3	16.0	16.4	16.8
Total ...	...	58.3	102.1	94.0	101.1
Deductions ...	...	...	...	...	...
Points gained ...	...	58.3	102.1	94.0	101.1
Remarks and Awards ...	...	...	1st Prize	Reserve.	2nd Prize.

CLASS 4.—SHORTHORN HEIFERS (NOT EXCEEDING THREE YEARS).—Continued.

Number ...	...	...	...	103 Stretton Maid	104 Sarah	105 Lady Nelson	106 Dorothy
Name	...	...	...	Dec. 11, 1910.	Dec. 15, 1910.	Sept. 19, 1910.	Sept. 3, 1910.
Born	...	...	...	Sept. 25. 27	Sept. 12. 40	Sept. 10. 42	Sept. 27. 25
Number of Calves	...	...	...	...	...	...	...
Last Calved	...	...	...	...	...	...	...
Days since Calving	...	...	...	...	...	...	...
Weight of Milk, 1st day	...	...	...	Morn Even	Morn Even	Morn Even	Morn Even
Weight of Milk, 2nd day	...	...	...	17.4 15.3	16.1 13.4	21.2 20.2	22.7 19.8
Total	...	...	...	16.4 15.7	16.6 15.3	22.0 20.7	22.9 19.8
Average	...	...	...	33.8 31.0	32.7 28.7	43.2 40.9	45.6 39.6
Percentage of Fat	...	...	...	16.9 15.5	16.3 14.3	21.6 20.4	22.8 19.8
Composition of Solids other than Fat	...	...	...	4.33 4.49	4.05 3.46	3.09 3.64	4.15 4.76
the Milk.	...	...	...	8.93 8.91	8.65 8.98	9.23 9.04	8.91 8.74
Actual weight of Fat, in lbs.	...	...	...	13.26 13.40	12.70 12.44	12.32 12.68	13.06 13.50
Calculation of Points multiply by 20	...	...	...	.73 .69	.66 .49	.66 .74	.95 .95
Actual weight of Solids other than Fat, in lbs.	...	...	...	14.6 13.8	13.2 9.8	13.2 14.8	19.0 19.0
Calculation of Points multiply by 4	...	...	...	1.50 1.38	1.41 1.28	2.0 1.84	2.03 1.74
Points	...	...	...	6.0 5.52	5.64 5.12	8.0 7.36	8.12 6.96
For time since Calving	...	...	...	32.4	30.6	2	42.6
For weight of Fat	...	...	...	23.4	23.0	42.0	38.0
For weight of Solids other than Fat	...	...	...	11.5	10.8	28.0	15.1
Total	...	...	...	72.3	64.4	85.6	95.7
Deductions	...	...	...	—	—	—	—
Points gained	...	...	...	72.3	64.4	85.6	95.7
Remarks and Awards	...	...	...	High Commendation.	3rd Prize.	3rd Prize.	3rd Prize.

CLASS 4—SHORTHORN HEIFERS (NOT EXCEEDING THREE YEARS)—Continued.

Number Name	...	...	...	...	107 Millicent 2nd. 2 yrs. 10 mos. July 5. 101	108 Silverson Madge. Dec. 7, 1910. 1 Aug. 22. 61	109 Dolly. — 1 Sept. 12. 40
Born	...	...	...	...	...	...	...
Number of Calves	...	...	...	...	...	...	...
Last Calved	...	...	...	...	...	...	...
Days since Calving	...	...	...	...	...	...	...
Weight of Milk, 1st day	...	...	...	...	Morn	Even	Morn
Weight of Milk, 2nd day	...	...	...	...	17.8	17.2	16.4
Total	...	...	...	...	19.6	15.8	15.0
Average	...	...	...	...	37.4	33.0	28.0
...	...	...	...	...	18.7	16.5	14.0
Percentage { Fat ...	...	...	...	...	3.61	4.45	2.16
Composition of { Solids other than Fat	...	...	...	...	8.57	8.15	8.24
the Milk, { Solids	...	...	...	...	12.18	12.60	10.40
Actual weight of Fat, in lbs. ...	...	...	...	...	.67	.73	.30
Calculation of Points multiply by 20	...	...	...	...	13.4	14.6	6.0
Actual weight of Solids other than Fat, in lbs.	...	...	...	...	1.60	1.35	1.15
Calculation of Points multiply by 4	...	...	...	...	6.40	5.40	4.60
(For time since Calving	...	...	...	...	6.9	2.1	—
Points { For weight of Milk ...	...	...	...	...	35.2	28.0	28.5
(For weight of Fat ...	...	...	...	...	28.0	14.0	28.6
(For weight of Solids other than Fat	...	...	...	...	11.8	9.2	10.9
Total ...	...	...	...	...	81.9	53.3	69.0
Deductions ...	...	...	...	...	10.0	40.0	—
Points gained	...	...	...	...	71.9	13.3	69.0
Remarks and Awards ...	...	...	...	...	...	...	...



CLASS 5.—LINCOLNSHIRE RED SHORTHORN COWS.

Number ...	...	...	...	111	112	113	114
Name ..	...	...	...	Canwick Miller 2nd.	Bracebridge No. 189.	Bracebridge No. 188 B.	Barton Irene.
Born ...	...	...	...	Jan 1, 1907.	Jan. 30, 1903.	May 15, 1908.	Aug. 1909.
Number of Calves	...	...	...	4	7	3	—
Last Calved	...	...	...	May 2.	Sept. 11.	Sept. 7.	Aug. 31.
Days since Calving	...	...	...	173	41	45	52
Weight of Milk, 1st day	...	...	...	Morn	Morn	Morn	Morn
Weight of Milk, 2nd day	...	...	...	Even	Even	Even	Even
Total	...	...	...	23.9 18.3	34.3 29.4	24.6 20.2	27.8 23.3
Average	...	...	...	21.8 19.6	28.6 17.1	22.9 17.0	27.8 23.5
...	...	...	...	45.7 37.9	62.9 46.5	47.5 37.2	55.6 46.8
...	...	...	...	22.8 18.9	31.4 23.2	23.7 18.6	27.8 23.4
Percentage	...	...	...	3.68 3.78	3.93 3.27	3.65 3.14	3.62 4.05
Composition of	...	...	...	8.52 8.52	9.37 9.19	8.79 8.94	8.78 8.87
the Milk.	...	...	...	12.20 12.30	13.30 12.46	12.44 12.08	12.40 12.92
Actual weight of Fat, in lbs.	...	...	...	.84 .72	1.23 .76	.87 .58	1.00 .95
Calculation of Points multiply by 20	...	...	...	16.8 14.4	24.6 15.2	17.4 11.6	20.0 19.0
Actual weight of Solids other than Fat, in lbs.	...	...	...	1.94 1.60	2.94 2.13	2.08 1.66	2.44 2.08
Calculation of Points multiply by 4	...	...	...	7.76 6.40	11.76 8.52	8.32 6.64	9.76 8.32
Points	...	...	...	12.0	.1	.5	1.2
For time since Calving	...	...	...	41.7	54.6	42.3	51.2
For weight of Fat	...	...	...	31.2	39.8	29.0	39.0
For weight of Solids other than Fat	...	...	...	14.2	20.3	15.0	18.1
Total	...	...	...	99.1	114.8	86.8	109.5
Deductions	...	...	...	—	—	—	—
Points gained	...	...	...	99.1	114.8	86.8	109.5
Remarks and Awards ...	...	...	...	...	1st Prize.	...	3rd Prize.

CLASS 5.—LINCOLNSHIRE RED SHORTHORN COWS—Continued.

Number ...	...	...	...	...	...	115		117		118	
						Burton Ruby 15th.	Happy Returns.	Burton Ruby 12th.	Happy Returns.	Burton Ruby 12th.	Happy Returns.
Born ...	...	...	...	...	...	Sept. 2, 1900.	Nov. 9, 1904.	Nov. 28, 1905.	Nov. 9, 1904.	Nov. 28, 1905.	Nov. 9, 1904.
Number of Calves ...	...	...	...	...	...	Sept. 16.	Sept. 4.	Sept. 5.	Sept. 4.	Sept. 5.	Sept. 4.
Last Calved ...	...	...	...	...	...	36	47	47	48	47	48
Days since Calving ...	...	...	...	...	...	...	...	...	...	...	...
Weight of Milk, 1st day	...	...	...	...	...	Morn Even	Morn Even	Morn Even	Morn Even	Morn Even	Morn Even
Weight of Milk, 2nd day	...	...	...	...	...	30.6 26.5	24.7 20.5	24.7 20.5	20.0 16.6	24.2 20.5	20.0 16.6
Total ...	...	...	...	...	...	31.4 25.8	25.1 22.2	25.1 22.2	24.2 20.5	24.2 20.5	24.2 20.5
Average ...	...	...	...	...	...	62.0 52.3	49.8 42.7	49.8 42.7	44.2 37.1	44.2 37.1	44.2 37.1
Percentage (Fat ...	...	...	...	...	...	31.0 26.1	24.9 21.3	24.9 21.3	22.1 18.5	22.1 18.5	22.1 18.5
Composition of Solids other than Fat	...	...	...	...	...	3.11 3.02	3.25 3.63	3.25 3.63	3.83 3.51	3.83 3.51	3.83 3.51
the Milk. (Solids ...	...	...	...	...	...	8.93 8.94	8.19 8.25	8.19 8.25	8.57 8.51	8.57 8.51	8.57 8.51
Actual weight of Fat, in lbs. ...	...	...	...	...	...	12.04 11.96	11.44 11.88	11.44 11.88	12.40 12.02	12.40 12.02	12.40 12.02
Calculation of Points multiply by 20	...	...	...	...	...	.97 .78	.80 .78	.80 .78	.85 .65	.85 .65	.85 .65
Actual weight of Solids other than Fat, in lbs.	...	...	...	...	...	19.4 15.6	16.0 15.6	16.0 15.6	17.0 13.0	17.0 13.0	17.0 13.0
Calculation of Points multiply by 4	...	...	...	...	...	2.75 2.34	2.04 1.76	2.04 1.76	1.90 1.57	1.90 1.57	1.90 1.57
Points { For time since Calving ...	...	...	...	...	...	11.04 9.36	8.16 7.04	8.16 7.04	7.60 6.28	7.60 6.28	7.60 6.28
For weight of Milk ...	...	...	...	...	...	57.1	46.2	46.2	40.6	40.6	40.6
For weight of Fat ...	...	...	...	...	...	35.0	31.6	31.6	30.0	30.0	30.0
For weight of Solids other than Fat ...	...	...	...	...	...	20.4	15.2	15.2	13.9	13.9	13.9
Total ...	...	...	...	...	...	112.5	93.7	93.7	85.3	85.3	85.3
Deductions ...	...	...	...	...	...	—	20.0	20.0	—	—	—
Points gained	...	...	...	...	...	112.5	73.7	73.7	85.3	85.3	85.3
Remarks and Awards ...	...	...	...	...	...	2nd Prize.	2nd Prize.	2nd Prize.	2nd Prize.	2nd Prize.	2nd Prize.



Class 6. LINCOLNSHIRE RED SHORTHORN HEIFERS (NOT EXCEEDING THREE YEARS)—Continued.

		125	
Number ...	...	...	Barton Aug 4th.
Name ...	...	...	April 28, 1911.
Born ...	...	...	Sept. 22.
Number of Calves	...	...	30
Last Calved ...	...	...	
Days since Calving	...	...	
		Morn	Even
Weight of Milk, 1st day	...	20.8	17.4
Weight of Milk, 2nd day	...	21.3	17.8
Total	...	42.1	35.2
Average	...	21.0	17.6
		3.66	3.76
Percentage of Composition of the Milk.		9.04	9.04
Actual weight of Fat, in lbs. ...		12.70	12.80
Calculation of Points multiply by 20		.77	.66
		15.4	13.2
Actual weight of Solids other than Fat, in lbs.		1.90	1.60
Calculation of Points multiply by 4		7.60	6.40
		38.6	
Points (For time since Calving ...)		28.6	
Points (For weight of Milk ...)		14.0	
Points (For weight of Fat ...)		81.2	
Points (For weight of Solids other than Fat ...)			
Total			
Deductions			
Points gained		81.2	
Remarks and Awards ...			1st Prize.



CLASS 7. —JERSEY COWS—Continued.

Number ...	...	...	131	134	135	136
Name ...	...	...	Carrin.	La Franchise vel	Malmsey	Promise.
Born ...	...	...	April 16, 1910	Mar. 14, 1907.	Aug. 12, 1906.	April 30, 1906.
Number of Calves ...	...	...	2	4	—	—
Last Calved ...	...	...	July 28.	April 28.	April 21.	March 12.
Days since Calving ...	...	...	86	177	184	223
Weight of Milk, 1st day	...	...	Morn Even	Morn Even	Morn Even	Morn Even
Weight of Milk, 2nd day	...	...	17.0 15.0	17.3 13.2	24.3 21.2	21.1 20.5
Total	...	...	18.9 11.7	16.3 12.3	24.5 19.8	18.2 20.0
Average ...	...	...	35.9 26.7	32.6 25.5	48.8 41.0	39.3 40.5
Percentage of Fat ...	...	...	17.9 13.3	16.3 12.7	24.4 20.5	19.6 20.2
Composition of the Milk. { Solids other than Fat	...	...	5.76 3.78	3.14 4.61	3.09 6.18	4.81 6.82
Actual weight of Fat, in lbs. ...	...	...	8.94 8.96	9.86 8.71	9.05 8.76	9.27 8.88
Calculation of Points multiply by 20	...	...	14.70 14.74	13.00 13.32	14.14 14.94	14.08 15.70
Actual weight of Solids other than Fat, in lbs	...	...	1.03 .77	.51 .59	1.24 1.27	.94 1.38
Calculation of Points multiply by 4	...	...	20.6 15.4	10.2 11.8	24.8 25.4	18.8 27.6
Actual weight of Solids other than Fat, in lbs	...	...	1.60 1.19	1.60 1.11	2.21 1.80	1.80 1.80
Calculation of Points multiply by 4	...	...	6.40 4.76	6.40 4.44	8.84 7.20	7.20 7.20
For time since Calving	...	...	4.6	12.0	12.0	12.0
For weight of Milk ...	...	...	31.2	29.0	44.9	39.8
For weight of Fat ...	...	...	36.0	22.0	50.2	46.4
For weight of Solids other than Fat	...	...	11.2	10.8	16.0	14.4
Total ...	...	...	83.0	73.8	123.1	112.6
Deductions ...	...	...	—	—	—	—
Points gained	...	...	83.0	73.8	123.1	112.6
Remarks and Awards ...	...	...	...	1st Prize	2nd Prize	2nd Prize.

CLASS 7.—JERSEY COWS—Continued.

Number ...	...	...	137 Nerine.	138 Loulah 3rd.	139 Pamela 2nd.	141 Stockwell's Maiden.
Name ...	...	...	...	...	...	...
Born ...	...	...	April 28, 1908.	Oct. 17, 1904.	Oct. 17, 1904.	Feb. 23, 1910.
Number of Calves ...	...	...	...	...	...	...
Last Calved ...	...	...	Aug. 17. 66	July 2. 112	Mar. 21. 214	Aug. 22. 61
Days since Calving ...	...	...	...	...	...	...
Weight of Milk, 1st day ...	...	...	Morn Even	Morn Even	Morn Even	Morn Even
Weight of Milk, 2nd day ...	...	...	20.4 20.0	19.8 20.4	18.0 19.6	15.1 13.6
Total ...	...	...	22.3 21.2	23.0 21.2	20.3 19.7	17.5 13.6
Average ...	...	...	42.7 41.2	42.8 41.6	38.3 39.3	32.6 27.2
...	...	...	21.3 20.6	21.4 20.8	19.1 19.6	16.3 13.6
Percentage { Fat ...	...	...	4.21 5.49	3.74 4.24	4.13 5.59	5.04 4.33
Composition of { Solids other than Fat	...	...	9.43 9.41	9.06 8.86	9.39 9.11	9.32 9.41
the Milk. { Solids	...	...	13.64 14.90	12.80 13.10	13.52 14.70	14.36 13.74
Actual weight of Fat, in lbs. ...	...	...	.90 1.13	.80 .88	.79 1.09	.82 .59
Calculation of Points multiply by 20	...	...	18.0 22.6	16.0 17.6	15.8 21.8	16.4 11.8
Actual weight of Solids other than Fat, in lbs.	...	...	2.00 1.94	1.94 1.84	1.80 1.78	1.52 1.28
Calculation of Points multiply by 4	...	...	8.00 7.76	7.76 7.36	7.20 7.12	6.08 5.12
Points { For time since Calving	...	...	2.6	7.2	12.0	2.1
{ For weight of Milk ...	...	...	41.9	42.2	38.7	29.9
{ For weight of Fat ...	...	...	40.6	33.6	37.6	28.2
{ For weight of Solids other than Fat	...	...	15.8	15.1	14.3	11.2
Total ...	...	...	100.9	98.1	102.6	71.4
Deductions ...	...	...	—	—	—	—
Points gained	...	...	100.9	98.1	102.6	71.4
Remarks and Awards ...	...	...	Reserve.	High Commendation.	3rd Prize.	...

## CLASS 10.—GUERNSEY COWS.

Number ... Name ...	...	...	...	...	181 Uadine 2nd Mar. 18, 1900.	182 Wickham Farm 2nd. Nov 3, 1906.	184 Brittleware Ivy. April 24, 1910.	185 Brittleware Edith. Jan. 28, 1906.
Born ...	...	...	...	...	Sept 1. 51	March 26, 209	2 Sept. 26.	4 April 9, 196
Number of Calves ...	...	...	...	...	...	...	...	...
Last Calved ...	...	...	...	...	...	...	...	...
Days since Calving ...	...	...	...	...	...	...	...	...
Weight of Milk, 1st day ...	...	...	...	...	Morn	Even	Morn	Even
Weight of Milk, 2nd day ...	...	...	...	...	22.1	16.7	20.0	10.9
Total ...	...	...	...	...	19.5	15.0	22.4	11.8
Average ...	...	...	...	...	41.6	31.7	42.4	22.7
Percentage of Fat ...	...	...	...	...	20.8	15.8	21.2	11.3
Composition of the Milk. (Solids ...)	...	...	...	...	4.41	4.84	3.85	5.18
Actual weight of Fat, in lbs. ...	...	...	...	...	9.19	9.28	9.41	9.88
Calculation of Points multiply by 20 ...	...	...	...	...	13.66	14.12	13.44	15.06
Actual weight of Solids other than Fat ...	...	...	...	...	.92	.76	.81	.59
Calculation of Points multiply by 4 ...	...	...	...	...	18.4	15.2	16.2	11.8
Actual weight of Solids other than Fat, in lbs. ...	...	...	...	...	1.42	1.47	2.02	1.12
Calculation of Points, multiply by 4 ...	...	...	...	...	7.68	3.88	8.08	4.48
(For time since Calving ...)	...	...	...	...	1.1	12.0	—	12.0
Points (For weight of Milk ...)	...	...	...	...	36.6	30.5	41.6	21.4
(For weight of Fat ...)	...	...	...	...	33.6	34.4	38.0	22.6
(For weight of Solids other than Fat ...)	...	...	...	...	13.6	11.4	15.7	8.5
Total ...	...	...	...	...	84.9	88.3	93.3	64.5
Deductions ...	...	...	...	...	—	—	—	—
Points gained ...	...	...	...	...	84.9	88.3	93.3	64.5
Remarks and Awards ...	...	...	...	...	High Commendation.	Reserve.	2nd Prize.	



## CLASS 10.—GUERNSEY COWS—Continued.

Number	187	188	189	190
Name	Donnington Juno.	Folly 3rd of the Mill.	Hayes Nellie 7th.	Gold Cup of Hatch 2nd.
Born	Oct. 8, 1909.	Oct. 9, 1905.	Dec. 26, 1909	Feb. 14, 1904.
Number of Calves	3	—	—	8
Last Calved	July 6	March 24.	July 20.	Sept. 5.
Days since Calving	108	211	94	47
Weight of Milk, 1st day	Morn Even	Morn Even	Morn Even	Morn Even
Weight of Milk, 2nd day	23-0 18-1	14-7 10-2	15-7 11-9	14-1 14-2
Total	21-3 17-8	13-6 10-8	13-1 11-8	14-8 13-5
Average	44-3 35-9	28-3 21-0	28-8 23-7	28-9 27-7
Percentage (Fat ...)	22-1 17-9	14-1 10-5	14-4 11-8	14-4 13-8
Composition of Solids other than Fat	3-87 4-42	4-69 5-24	4-53 5-85	4-20 5-26
the Milk. (Solids ...)	8-83 8-90	8-97 9-06	9-17 8-91	9-10 8-74
Actual weight of Fat, in lbs. ...	12-70 13-32	13-66 14-30	13-70 14-76	13-30 14-00
Calculation of Points multiply by 20	.85 .79	.06 .55	.65 .69	.60 .73
Actual weight of Solids other than Fat, in lbs.	17-0 15-8	13-2 11-0	13-0 13-8	12-0 14-6
Calculation of Points multiply by 4	1-95 1-60	1-34 .95	1-32 1-05	1-31 1-21
(For time since Calving	7-80 6-4	5-36 3-8	5-28 4-2	5-24 4-84
Points (For weight of Milk ...)	6-8	12-0	5-4	7
(For weight of Fat ...)	40-0	24-6	26-2	28-2
(For weight of Solids other than Fat	32-8	24-2	26-8	26-6
Total	14-2	9-2	9-5	10-1
Deductions	93-8	70-0	67-9	65-6
Points gained	93-8	70-0	67-9	65-6
Remarks and Awards	1st Prize.			

CLASS 10.—GUERNSEY COWS.—Continued.

Number ... Name ...	...	...	...	...	...	191		...	193	
						Treacle 3rd.	Daily of the Freehold.			
Born ...	...	...	...	...	...	Jan. 14, 1909.	June 17, 1908.	...	...	...
Number of Calves ...	...	...	...	...	...	3	4	...	...	...
Last Calved ...	...	...	...	...	...	April 27.	March 22.	...	...	...
Days since Calving ...	...	...	...	...	...	178	213	...	...	...
Weight of Milk, 1st day	...	...	...	...	...	Morn	Even	...	...	...
Weight of Milk, 2nd day	...	...	...	...	...	17.3	13.9	...	9.2	7.1
Total ...	...	...	...	...	...	17.1	16.8	...	9.0	7.6
Average ...	...	...	...	...	...	34.4	30.7	...	18.2	14.7
...	...	...	...	...	...	17.2	15.3	...	9.1	7.3
Percentage of Fat ...	...	...	...	...	...	4.92	5.07	...	6.17	6.75
Composition of Solids other than Fat	...	...	...	...	...	9.30	9.23	...	9.55	9.29
the Milk.	...	...	...	...	...	14.22	14.30	...	16.72	16.04
Actual weight of Fat, in lbs. ...	...	...	...	...	...	.85	.78	...	.56	.49
Calculation of Points multiply by 20	...	...	...	...	...	17.0	15.6	...	11.2	9.8
Actual weight of Solids other than Fat, in lbs.	...	...	...	...	...	1.60	1.41	...	.87	.68
Calculation of Points multiply by 4	...	...	...	...	...	6.40	5.64	...	3.48	2.72
For time since Calving	...	...	...	...	...	12.0	...	...	12.0	...
For weight of Milk	...	...	...	...	...	32.5	...	...	16.4	...
For weight of Fat	...	...	...	...	...	32.6	...	...	21.0	...
For weight of Solids other than Fat	...	...	...	...	...	12.0	...	...	6.2	...
Total ...	...	...	...	...	...	89.1	...	...	55.6	...
Deductions ...	...	...	...	...	...	...	...	...	...	...
Points gained	...	...	...	...	...	89.1	...	...	55.6	...
Remarks and Awards ...	...	...	...	...	...	3rd Prize.	...	...	...	...



Class 12.—RED POLL COWS—Continued.

Number ... Name ...	...	...	...	...	...	207 Locket	208 Danseuse, Jan. 9, 1909. 3 Aug. 9, 74
Born ...	...	...	...	...	...	Dec. 30, 1906. 5	
Number of Calves	...	...	...	...	...	Aug. 10. 73	
Last Calved ...	...	...	...	...	...		
Days since Calving	...	...	...	...	...		
Weight of Milk, 1st day	...	...	...	...	...	Morn Even	
Weight of Milk, 2nd day	...	...	...	...	...	17.7 15.3	16.5 14.9
Total ...	...	...	...	...	...	17.2 14.8	17.6 15.1
Average ...	...	...	...	...	...	34.9 30.1	34.1 30.0
	...	...	...	...	...	17.4 15.0	17.0 15.0
Percentage { Fat ...	...	...	...	...	...	2.91 3.16	3.51 3.82
Composition { Solids other than Fat	...	...	...	...	...	8.89 8.64	9.01 8.78
the Milk. { Solids	...	...	...	...	...	11.80 11.80	12.52 12.60
Actual weight of Fat, in lbs. ...	...	...	...	...	...	.51 .47	.60 .57
Calculation of Points multiply by 20	...	...	...	...	...	10.2 9.4	12.0 11.4
Actual weight of Solids other than Fat, in lbs.	...	...	...	...	...	1.55 1.30	1.54 1.31
Calculation of Points multiply by 4	...	...	...	...	...	6.20 5.2	6.16 5.24
Points { For time since Calving	...	...	...	...	...	3.3	3.4
{ For weight of Milk	...	...	...	...	...	32.4	32.0
{ For weight of Fat	...	...	...	...	...	19.6	23.4
{ For weight of Solids other than Fat	...	...	...	...	...	11.4	11.4
Total ...	...	...	...	...	...	66.7	70.2
Deductions ...	...	...	...	...	...	10.0	—
Points gained	...	...	...	...	...	56.7	70.2
Remarks and Awards ...	...	...	...	...	...		

Class 13.—RED POLL HEIFERS (NOT EXCEEDING THREE YEARS).

Number ...	...	...	...	209 Sudbourne Berry.	210 Sudbourne Bright.	211 Sudbourne Flirt.	212 The League.
Name ...	...	...	...	Mar. 23, 1911. 1 Aug. 18. 65	Sept. 6, 1910. 1 Aug. 17. 66	April 22, 1911. 1 Aug. 29 54	Jan. 1, 1911. 1 Aug. 17. 66
Born ...	...	...	...	...	...	...	...
Number of Calves	...	...	...	...	...	...	...
Least Calved ...	...	...	...	...	...	...	...
Days since Calving	...	...	...	...	...	...	...
Weight of Milk, 1st day	...	...	...	Morn Even	Morn Even	Morn Even	Morn Even
Weight of Milk, 2nd day	...	...	...	16.8 15.5	13.4 13.8	15.1 12.7	16.8 14.5
Total	...	...	...	17.8 14.8	15.8 14.2	15.3 13.7	16.8 14.4
Average ...	...	...	...	34.6 30.3	29.2 28.0	30.4 26.4	33.6 28.9
Percentage (Fat ...	...	...	...	17.3 15.1	14.6 14.0	15.2 13.2	16.8 14.4
Composition of { Solids other than Fat	...	...	...	4.00 4.14	4.11 4.03	3.46 3.82	4.63 4.26
the Milk. { Solids	...	...	...	9.64 9.34	9.13 8.91	9.00 8.78	9.29 9.14
Actual weight of Fat, in lbs. ...	...	...	...	13.64 13.48	13.24 13.54	12.46 12.60	13.92 13.40
Calculation of Points multiply by 20	...	...	...	.69 .62	.60 .65	.52 .51	.78 .61
Actual weight of Solids other than Fat, in lbs.	...	...	...	13.8 12.4	12.0 13.0	10.4 10.2	15.6 12.2
Calculation of Points multiply by 4	...	...	...	1.67 1.40	1.33 1.25	1.37 1.15	1.55 1.32
Points { For time since Calving	...	...	...	6.68 5.6	5.32 5.0	5.48 4.60	6.20 5.3
{ For weight of Milk	...	...	...	2.5	2.6	1.4	2.6
{ For weight of Fat	...	...	...	32.4	28.6	28.4	31.2
{ For weight of Solids other than Fat	...	...	...	26.2	25.0	20.6	27.8
Total ...	...	...	...	12.3	10.3	10.1	11.5
Deductions ...	...	...	...	73.4	66.5	60.5	73.1
Points gained	...	...	...	73.4	66.5	60.5	73.1
Remarks and Awards ...	...	...	...	2nd Prize.	High Commendation.	High Commendation.	3rd Prize.

CLASS 13.—RED POLL HEIFERS (NOT EXCEEDING THREE YEARS).—(Continued.)

Number ...	...	...	...	213 Velveten.	215 Ashmoor Flon.	216 Attraction.	217 Mandoline.
Name ...	...	...	...	...	...	...	...
Born ...	...	...	...	Oct. 8, 1910.	April 28, 1911.	Dec. 9, 1910.	Dec. 16, 1910.
Number of Calves	...	...	...	...	...	...	...
Last Calved ...	...	...	...	Sept. 19.	Aug. 9.	Aug. 19.	Aug. 22.
Days since Calving	...	...	...	33	74	64	55
Weight of Milk, 1st day	...	...	...	Morn	Morn	Morn	Morn
Weight of Milk, 2nd day	...	...	...	Even	Even	Even	Even
Total ...	...	...	...	14.5 15.6	16.3 15.3	13.9 12.8	17.0 15.5
Average ...	...	...	...	17.3 15.5	17.5 15.1	14.1 13.1	18.3 15.5
Percentage { Fat ...	...	...	...	31.8 31.1	33.8 30.4	28.0 25.9	35.3 31.0
Composition of { Solids other than Fat	...	...	...	15.9 15.5	18.9 15.2	14.0 12.9	17.6 15.5
the Milk. { Solids	...	...	...	4.12 4.64	3.00 3.04	3.01 3.37	3.77 3.51
Actual weight of Fat, in lbs. ...	...	...	...	9.48 8.95	9.50 8.92	9.21 8.69	9.11 8.99
Calculation of Points multiply by 20	...	...	...	13.60 13.60	12.50 11.96	12.22 12.06	12.88 12.50
Actual weight of Solids other than Fat, in lbs.	...	...	...	.67 .72	.51 .46	.42 .44	.66 .54
Calculation of Points multiply by 4	...	...	...	13.0 14.4	10.2 9.2	8.4 8.8	13.2 10.8
Points { For time since Calving	...	...	...	1.50 1.39	1.60 1.35	1.30 1.12	1.60 1.40
{ For weight of Milk ...	...	...	...	6.00 5.56	6.40 5.4	5.20 4.5	6.40 5.6
{ For weight of Fat ...	...	...	...	...	3.4	2.4	2.1
{ For weight of Solids other than Fat	...	...	...	31.4	32.1	26.9	33.1
Total ...	...	...	...	27.4	19.4	17.2	24.0
Deductions ...	...	...	...	11.6	11.8	9.7	12.0
Points gained	...	...	...	70.4	66.7	36.2	71.2
Remarks and Awards ...	...	...	...	70.4	66.7	56.2	71.2
	...	...	...	High Commendation	High Commendation	Reserve.	Reserve.

CLASS 13.—RED POLL HEIFERS (NOT EXCEEDING THREE YEARS)—(Continued.)

Number ...	...	...	...	...	218
Name ...	...	...	...	...	Rondelcham Lady Maud.
Born ...	...	...	...	...	Oct. 10, 1910.
Number of Calves ...	...	...	...	...	—
Last Calved ...	...	...	...	...	Aug. 28.
Days since Calving ...	...	...	...	...	55
Weight of Milk, 1st day	...	...	...	...	Morn Even
Weight of Milk, 2nd day	...	...	...	...	17.7 16.2
Total ...	...	...	...	...	19.5 17.1
Average	...	...	...	...	37.2 33.3
Percentage { Fat ...	...	...	...	...	18.6 16.6
Composition of { Solids other than Fat	...	...	...	...	4.09 4.76
the Milk. { Solids	...	...	...	...	9.71 9.54
Actual weight of Fat, in lbs. ...	...	...	...	...	13.80 14.30
Calculation of Points multiply by 20	...	...	...	...	.76 .79
Actual weight of Solids other than Fat, in lbs.	...	...	...	...	15.2 15.8
Calculation of Points multiply by 4 ...	...	...	...	...	1.80 1.58
Points { For time since Calving	...	...	...	...	7.20 6.3
{ For weight of Milk	...	...	...	...	1.5
{ For weight of Fat	...	...	...	...	35.2
{ For weight of Solids other than Fat	...	...	...	...	31.0
Total ...	...	...	...	...	13.5
Deductions	...	...	...	...	18.2
Points gained	...	...	...	...	—
Remarks and Awards ...	...	...	...	...	81.2
...	...	...	...	...	1st Prize.
...	...	...	...	...	Red Poll Society's Prize.

## CLASS 14—AYRSHIRE COWS.

Number	...	...	...	219	...	220	...	222	...	224
Name	...	...	...	Charlotte.	...	Balgiddan Hughana.	...	Harleyford Jeanne.	...	Southfield Annie.
Born	...	...	...	Feb., 1906.	...	Feb., 1908.	...	Mar., 1909.	...	6 Years.
Number of Calves	...	...	...	Oct. 5	...	Oct. 6.	...	Aug. 1.	...	3
Last Calved	...	...	...	17	...	16	...	82	...	Oct. 4.
Days since Calving	...	...	...	...	...	...	...	...	...	18
Weight of Milk, 1st day	...	...	...	Morn	Even	Morn	Even	Morn	Even	Morn
Weight of Milk, 2nd day	...	...	...	24.2	26.0	23.0	21.0	20.9	19.5	31.2
Total	...	...	...	24.7	22.6	24.5	20.3	22.8	21.0	32.0
Average	...	...	...	48.9	42.6	47.5	41.3	43.7	40.5	63.2
Percentage	...	...	...	24.4	21.3	23.7	20.6	21.8	20.2	31.6
Composition of	...	...	...	3.74	4.25	4.08	4.04	4.68	5.15	4.12
the Milk.	...	...	...	9.06	8.61	9.66	9.62	10.08	9.55	9.48
Actual weight of Fat, in lbs.	...	...	...	12.80	12.86	13.74	13.66	14.75	14.70	13.60
Calculation of Points multiply by 20	...	...	...	.92	.90	.97	.83	1.02	1.04	1.30
Actual weight of Solids other than Fat, in lbs.	...	...	...	18.4	18.0	19.4	16.6	20.4	20.8	26.0
Calculation of Points multiply by 4	...	...	...	2.20	1.84	2.30	1.98	2.36	1.93	3.0
Points	...	...	...	8.80	7.36	9.20	7.92	9.44	7.72	12.0
For time since Calving	...	...	...	...	...	...	...	4.2	...	...
For weight of Milk	...	...	...	45.7	...	44.3	...	42.0	...	59.7
For weight of Fat	...	...	...	36.4	...	36.0	...	41.2	...	48.0
For weight of Solids other than Fat	...	...	...	16.2	...	17.1	...	17.2	...	22.5
Total	...	...	...	98.3	...	97.4	...	104.6	...	130.2
Deductions	...	...	...	...	...	...	...	...	...	...
Points gained	...	...	...	98.3	...	97.4	...	104.6	...	130.2
Remarks and Awards	...	...	...	2nd Prize.	...	Reserve.	...	1st Prize.	...	Disqualified.





## CLASS 16.—KERRY COWS.

Number ... Name ...	...	...	...	...	229 Munley Princess.	230 Rivernook Jess.	231 Rivernook Betty.	232 Rivernook Minnie.
Born ...	...	...	...	...	April, 1909.	1910.	1909.	1910.
Number of Calves ...	...	...	...	...	1	—	—	—
Last Calved ...	...	...	...	...	Sept 29, 23	Sept. 10 42	Aug. 15 08	Sept. 11, 41
Days since Calving ...	...	...	...	...	...	...	...	...
Weight of Milk, 1st day	...	...	...	...	Morn Even	Morn Even	Morn Even	Morn Even
Weight of Milk, 2nd day	...	...	...	...	21.9 20.6	14.3 12.4	10.5 8.8	11.4 9.5
Total	...	...	...	...	24.1 19.7	16.3 12.9	11.0 8.4	12.0 9.2
Average	...	...	...	...	46.0 40.3	30.6 25.3	21.5 17.2	23.4 18.7
Percentage (Fat ...	...	...	...	...	23.0 20.1	15.3 12.6	10.7 8.6	11.7 9.3
Composition of (Solids other than Fat	...	...	...	...	3.73 4.19	3.87 4.03	4.34 4.47	4.62 4.08
the Milk. (Solids ...	...	...	...	...	9.59 9.65	9.59 9.17	9.46 9.73	9.28 9.22
Actual weight of Fat, in lbs. ...	...	...	...	...	13.32 13.84	13.46 13.40	13.80 14.20	13.90 13.90
Calculation of Points multiply by 20	...	...	...	...	.86 .84	.59 .51	.47 .38	.54 .44
Actual weight of Solids other than Fat, in lbs.	...	...	...	...	17.2 16.8	11.8 10.2	9.4 7.6	10.8 8.8
Calculation of Points multiply by 4	...	...	...	...	2.20 1.94	1.46 1.18	1.01 .84	1.08 .86
Points (For time since Calving	...	...	...	...	8.80 7.76	5.84 4.72	4.04 3.36	4.32 3.44
(For weight of Milk ...	...	...	...	...	43.1	27.9	2	.1
(For weight of Fat ...	...	...	...	...	34.0	22.0	19.3	21.0
(For weight of Solids other than Fat	...	...	...	...	16.6	10.6	17.0	19.6
Total ...	...	...	...	...	93.7	60.7	7.4	7.8
Deductions ...	...	...	...	...	—	—	46.5	48.5
Points gained	...	...	...	...	93.7	60.7	—	—
Remarks and Awards ...	...	...	...	...	1st Prize.	—	46.5	48.5

CLASS 16.—KERRY COWS—Continued

Number ...	...	...	...	...	233
Name ...	...	...	...	...	Raheny.
Born ...	...	...	...	...	April 9, 1904.
Number of Calves ...	...	...	...	...	—
Last Calved ...	...	...	...	...	Sept. 8.
Days since Calving ...	...	...	...	...	44
<hr/>					
Weight of Milk, 1st day	...	...	...	...	Morn Even
Weight of Milk, 2nd day	...	...	...	...	23.5 20.6
Total	...	...	...	...	24.4 21.0
Average	...	...	...	...	47.9 41.6
Percentage { Fat ...	...	...	...	...	23.9 20.8
Composition of { Solids other than Fat	...	...	...	...	3.29 3.55
the Milk. { Solids	...	...	...	...	9.27 9.25
Actual weight of Fat, in lbs. ...	...	...	...	...	12.56 12.80
Calculation of Points multiply by 20	...	...	...	...	.79 .74
Actual weight of Solids other than Fat, in lbs.	...	...	...	...	15.8 14.8
Calculation of Points multiply by 4 ...	...	...	...	...	2.22 1.92
...	...	...	...	...	8.88 7.68
<hr/>					
Points { For time since Calving	...	...	...	...	.4
{ For weight of Milk	...	...	...	...	44.7
{ For weight of Fat	...	...	...	...	30.6
{ For weight of Solids other than Fat	...	...	...	...	16.6
Total	...	...	...	...	92.3
Deductions	...	...	...	...	—
Points gained	...	...	...	...	92.3
<hr/>					
Remarks and Awards ...	...	...	...	...	Reserve.

## CLASS 23.—GOATS.

Number ...	287	288	289	290
Name ...	Ira Conny.	Wignone Cornflower.	Cowslip 3rd.	Leazes E.e.
Born ...	Mar. 15, 1910.	Jan. 23, 1910.	Feb. 21, 1908	April 3, 1907.
Number of Kids ...	2	5	8	—
Last Kided ...	April 25.	May 31.	May 28.	June 21.
Days since Kidding ...	180	144	147	123
Weight of Milk, 1st day	Morn Even	Morn Even	Morn Even	Morn Even
Weight of Milk, 2nd day	3-7 2-7	4-1 3-1	3-8 3-0	4-1 3-6
Total	4-1 3-1	4-7 3-5	4-0 3-1	4-7 3-6
Average ...	7-8 5-8	8-8 6-6	7-8 6-1	8-8 7-2
Percentage { Fat ...	3-9 2-9	4-4 3-3	3-9 3-05	4-4 3-6
Composition of { Solids other than Fat	5-20 4-32	5-17 5-39	5-51 5-46	3-62 4-79
the Milk. { Solids	9-40 9-08	9-09 8-77	9-41 8-80	9-04 8-95
Actual weight of Fat, in lbs. ...	14-60 13-40	14-26 14-16	14-92 14-26	12-66 13-74
Calculation of Points multiply by 20	.20 .125	.23 .18	.23 .17	.16 .17
Actual weight of Solids other than Fat, in lbs.	4-0 2-5	4-6 3-6	4-6 3-4	3-2 3-4
Calculation of Points multiply by 4	.36 .26	.40 .29	.37 .27	.40 .32
Points { For time since Kidding	1-44 1-04	1-60 1-16	1-48 1-08	1-60 1-28
{ For weight of Milk	3-0	2-4	2-45	2-05
{ For weight of Fat	6-8	7-7	6-95	8-00
{ For weight of Solids other than Fat	6-5	8-2	8-00	6-60
Total	2-48	2-76	2-56	2-88
Deductions	18-78	21-06	19-96	19-53
Points gained	18-78	21-06	19-96	1-00
Remarks and Awards ...	3rd Prize.	1st Prize. Patroness Burlett- Counts Challenge Cup.	2nd Prize.	4th Prize Reserve Challenge Cup.

CLASS 23.—GOATS—Continued.

Number ...	...	...	...	292 Sedgemere (rivers).	293 Hakton Hagar.	294 Devonia.	295 Widdean Balette.
Name ...	...	...	...	Mar. 7, 1911	Jan. 22, 1911.	Mar. 27, 1908.	July 23, 1908.
Born ...	...	...	...	2	...	...	...
Number of Kids ...	...	...	...	May 25	April 11.	July 18.	July 6.
Last Kid ...	...	...	...	150	194	96	108
Days since Kidding ...	...	...	...	...	...	...	...
Weight of Milk, 1st day ...	...	...	...	Morn	Even	Morn	Even
Weight of Milk, 2nd day ...	...	...	...	3-6	2-5	3-2	2-5
Total ...	...	...	...	3-4	2-9	3-5	2-6
Average ...	...	...	...	7-0	5-4	6-7	5-2
...	...	...	...	3-5	2-7	3-35	2-6
Percentage of Fat ...	...	...	...	4-35	3-86	4-03	4-28
Composition of Solids other than Fat ...	...	...	...	8-91	8-64	8-35	8-52
the Milk. Solids ...	...	...	...	13-26	12-50	12-38	12-80
Actual weight of Fat, in lbs. ...	...	...	...	.15	.10	.13	.11
Calculation of Points multiply by 20 ...	...	...	...	3-0	2-0	2-6	2-2
Actual weight of Solids other than Fat, in lbs. ...	...	...	...	.31	.23	.28	.22
Calculation of Points multiply by 4 ...	...	...	...	1-24	.92	1-12	.88
Points (For time since Kidding ...)	...	...	...	2-5	3-23	1-60	1-8
(For weight of Milk ...)	...	...	...	6-2	4-10	5-95	4-4
(For weight of Fat ...)	...	...	...	5-0	3-50	4-80	3-0
(For weight of Solids other than Fat ...)	...	...	...	2-16	1-60	2-00	1-52
Total ...	...	...	...	15-86	12-13	14-35	10-72
Deductions ...	...	...	...	1-00	1-00	...	2-0
Points gained ...	...	...	...	14-86	11-13	14-35	8-72
Remarks and Awards ...	...	...	...	Very High Commendation.	Very High Commendation.	Very High Commendation.	Very High Commendation.

CLASS 23.—GOATS—Continued.

Number Name	298 Cypthorne Maide April 10, 1910.	300 (at) eron Minnet. Feb. 5, 1909.	304 Addington Myrtle. Mar. 24, 1908.	305 Forest Runia. Jan. 17, 1911.
	Mat. 30. 305	Mar. 23. 212	July 12. 102	Aug. 12. 71
Born	...	...	...	...
Number of Kids	...	...	...	...
Least Kid	...	...	...	...
Days since Kidding	...	...	...	...
Weight of Milk, 1st day	Morn 3.3 Even 2.9	Morn 2.0 Even 1.5	Morn 1.9 Even 1.3	Morn 2.2 Even 1.8
Weight of Milk, 2nd day	4.0 3.0	2.4 1.9	2.1 1.3	2.5 1.5
Total	7.3	4.4	4.0	4.7
Average	3.65	2.95	2.0	2.35
Percentage (Fat ...)	3.83	3.58	4.37	5.61
Composition of Solids other than Fat	8.31	8.38	8.93	9.43
the Milk. (Solids, ...)	12.14	11.96	13.30	15.04
Actual weight of Fat, in lbs. ...	1.10	1.10	1.09	1.13
Calculation of Points multiply by 20	2.0	2.0	1.8	2.6
Actual weight of Solids other than Fat, in lbs	.22	.24	.18	.22
Calculation of Points multiply by 4	.88	.96	.72	.88
Points { For time since Kidding For weight of Milk For weight of Fat For weight of Solids other than Fat Total Deductions Points gained	3.41	3.53	1.7	1.18
	6.60	3.90	3.3	4.00
	4.00	3.40	2.80	4.40
	1.84	1.40	1.20	1.52
	15.85	12.23	9.00	11.10
Remarks and Awards	2.0	—	1.0	—
	13.85	12.23	8.0	11.10
	High Commendation.	High Commendation.		

## Class 23.—GOATS—Continued.

Number ...	...	...	...	...	306	307	308	311
Name ...	...	...	...	...	Wigmore Thorn.	Wigmore Taney	Sadlerge Stonechat.	Killerton Pink Pearl.
Born ...	...	...	...	...	June 13, 1911. 2	May 7, 1911. 2	Mar. 20, 1909 6	Mar. 20, 1908.
Number of Kids ...	...	...	...	...	Aug. 31. 62	Mar. 21. 214	Mar. 22. 213	July 10. 104
Last Kiddled ...	...	...	...	...	...	...	...	...
Days since Kidding ...	...	...	...	...	...	...	...	...
Weight of Milk, 1st day ...	...	...	...	...	Morn Even	Morn Even	Morn Even	Morn Even
Weight of Milk, 2nd day ...	...	...	...	...	2-3 1-8	2-9 2-4	2-5 1-8	2-3 1-7
Total ...	...	...	...	...	2-5 1-9	3-3 2-6	2-6 1-9	2-7 2-2
Average ...	...	...	...	...	4-8 3-7	6-2 5-0	5-1 3-7	6-0 3-9
...	...	...	...	...	2-4 1-85	3-1 2-5	2-55 1-85	2-5 1-95
Percentage { Fat ...	...	...	...	...	4-86 6-09	5-84 5-65	5-33 5-18	4-03 4-58
Composition of { Solids other than Fat	...	...	...	...	9-54 9-55	9-76 9-21	9-65 9-62	8-59 9-02
the Milk. { Solids ...	...	...	...	...	14-40 15-64	15-60 14-86	14-98 14-80	12-62 13-60
Actual weight of Fat, in lbs. ...	...	...	...	...	.12 .11	.18 .14	.13 .09	.10 .09
Calculation of Points multiply by 20 ...	...	...	...	...	2-4 2-2	3-6 2-8	2-6 1-8	2-0 1-8
Actual weight of Solids other than Fat, in lbs.	...	...	...	...	.23 .18	.30 .23	.25 .18	.21 .17
Calculation of Points multiply by 4 ...	...	...	...	...	.92 .72	1-20 .92	1-00 .72	.84 .68
Points { For time since Kidding ...	...	...	...	...	...	3-56	3-55	1-73
{ For weight of Milk ...	...	...	...	...	4-25	5-40	4-40	4-45
{ For weight of Fat ...	...	...	...	...	4-6	6-4	4-40	3-80
{ For weight of Solids other than Fat	...	...	...	...	1-64	2-12	1-72	1-32
Total ...	...	...	...	...	10-49	17-68	14-07	11-50
Deductions ...	...	...	...	...	—	—	—	—
Points gained ...	...	...	...	...	10-49	17-68	14-07	11-50
Remarks and Awards ...	...	...	...	...	Reserve.	Reserve.	Very High Commendation.	—

Class 23.—GOATS—Continued.

Number ...	Name ...	Born ...	Number of Kids ...	Least Kidding ...	Days since Kidding ...	320 Leazes Lupin.		324 Cophorne Snowdrop		325 Killerton Garnet.		326 Killerton Moonstone.	
						Feb. 11, 1911.	June 19, 125	May, 1910. 3	Mar. 25, 210	July 14, 1908.	July 15, 99	April 14, 1909.	July 19, 95
Weight of Milk, 1st day	...	...	...	...	...	Morn	Even	Morn	Even	Morn	Even	Morn	Even
Weight of Milk, 2nd day	...	...	...	...	...	1.9	1.4	2.1	1.7	2.9	2.4	2.9	2.1
Total	...	...	...	...	...	2.5	1.6	2.7	2.1	3.4	2.7	2.9	2.2
Average	...	...	...	...	...	4.4	3.0	4.8	3.8	6.3	5.1	5.8	4.3
Percentage (Fat ...	...	...	...	...	...	2.2	1.5	2.4	1.9	3.15	2.55	2.9	2.15
Composition of Solids other than Fat	...	...	...	...	...	6.11	6.58	4.10	3.83	3.98	3.60	4.74	3.70
the Milk. (Solids	...	...	...	...	...	9.53	9.68	8.36	8.39	8.32	8.34	9.26	9.10
Actual weight of Fat, in lbs. ...	...	...	...	...	...	15.64	16.26	12.46	12.22	12.30	11.94	14.00	12.80
Calculation of Points multiply by 20	...	...	...	...	...	.13	.09	.10	.07	.12	.09	.14	.08
Actual weight of Solids other than Fat, in lbs.	...	...	...	...	...	2.6	1.8	2.0	1.4	2.4	1.8	2.8	1.6
Calculation of Points multiply by 4	...	...	...	...	...	.21	.15	.20	.16	.26	.21	.27	.20
Points (For time since Kidding	...	...	...	...	...	.84	.60	.80	.64	1.04	.84	1.08	.80
For weight of Milk ...	...	...	...	...	...	2.08	3.5	3.5	3.5	1.65	1.65	1.58	1.58
For weight of Fat ...	...	...	...	...	...	3.70	4.3	4.3	4.3	5.70	5.70	5.05	5.05
For weight of Solids other than Fat	...	...	...	...	...	4.40	3.4	3.4	3.4	4.20	4.20	4.40	4.40
Total ...	...	...	...	...	...	1.44	1.44	1.44	1.44	1.88	1.88	1.88	1.88
Deductions	...	...	...	...	...	11.62	11.62	12.64	12.64	13.43	13.43	12.91	12.91
Points gained	...	...	...	...	...	—	—	1.00	1.00	2.00	2.00	1.00	1.00
Remarks and Awards	...	...	...	...	...	11.62	11.62	11.64	11.64	11.43	11.43	11.91	11.91



CLASS 23. — GOATS—Continued.

Number ... Name ...	...	...	...	...	...	327 Killerton Topaz.		329 Dartmoor Hazel.		333 Hawthorne Granite.	
						Morn	Even	Morn	Even	Morn	Even
Born ...	...	...	...	...	...	2-5	1-9	2-7	2-1	3-5	2-5
Number of Kids ...	...	...	...	...	...	2-7	2-0	3-3	2-5	3-4	2-4
Last Kid ...	...	...	...	...	...	5-2	3-9	6-0	4-6	6-9	4-9
Days since Kidding ...	...	...	...	...	...	2-6	1-95	3-0	2-3	3-45	2-45
Weight of Milk, 1st day ...	...	...	...	...	...	5-80	5-08	4-13	3-58	5-17	5-06
Weight of Milk, 2nd day ...	...	...	...	...	...	9-20	9-12	8-61	8-82	9-55	9-70
Total ...	...	...	...	...	...	15-00	14-20	12-74	12-40	14-72	15-36
Average ...	...	...	...	...	...	15	10	12	08	19	14
Percentage (Fat ...	...	...	...	...	...	3-0	2-0	2-4	1-6	3-8	2-8
Composition of Solids other than Fat ...	...	...	...	...	...	24	18	26	20	34	24
the Milk. Solids ...	...	...	...	...	...	96	72	1-04	80	1-36	96
Actual weight of Fat, in lbs. ...	...	...	...	...	...	2-18	4-55	3-7	5-3	2-26	3-90
Calculation of Points multiply by 20 ...	...	...	...	...	...	4-55	5-00	5-3	6-60	3-90	5-90
Actual weight of Solids other than Fat, in lbs. ...	...	...	...	...	...	1-68	1-68	1-84	1-84	2-32	2-32
Calculation of Points multiply by 4 ...	...	...	...	...	...	13-41	13-41	14-84	14-84	17-08	17-08
Points { For time since Kidding ...	...	...	...	...	...	13-41	13-41	13-84	13-84	17-08	17-08
For weight of Milk ...	...	...	...	...	...	13-41	13-41	13-84	13-84	17-08	17-08
For weight of Fat ...	...	...	...	...	...	13-41	13-41	13-84	13-84	17-08	17-08
For weight of Solids other than Fat ...	...	...	...	...	...	13-41	13-41	13-84	13-84	17-08	17-08
Total ...	...	...	...	...	...	13-41	13-41	13-84	13-84	17-08	17-08
Deductions ...	...	...	...	...	...	13-41	13-41	13-84	13-84	17-08	17-08
Points gained ...	...	...	...	...	...	13-41	13-41	13-84	13-84	17-08	17-08
Remarks and Awards ...	...	...	...	...	...	High Commendation.	High Commendation.	High Commendation.	High Commendation.	Very High Commendation.	Very High Commendation.

## THE BUTTER TESTS, 1913.

By R. H. EVANS, B.Sc.

In the carrying out of the 1913 Butter Tests, a standard of points for each breed was adopted for the first time. Otherwise the tests were carried out on the same lines as in previous years.

The following are the scale of points and the standard of points for each breed :

One point for every ounce of butter ; one point for every completed 10 days since calving, deducting the first 40 days. Maximum allowance for period of lactation, 12 points.

Fractions of ounces of butter, and incomplete periods of less than 10 days, to be worked out in decimals, and added to the total points.

In the case of cows obtaining the same number of points, the prize to be awarded to the cow that has been the longest time in milk.

No prize will be given to animals in the Butter Tests which do not come up to the following standard : --

Breed.	Cows under 5 years. Points.	Cows 5 years and over. Points.
Pedigree Shorthorns ... ..	28	32
Non-Pedigree Shorthorns ... ..	30	34
Lincoln Red Shorthorns ... ..	30	34
Jerseys ... ..	30	35
Guernseys ... ..	27	30
Ayrshires ... ..	27	30
Red Polls ... ..	27	30
South Devons ... ..	30	34
Kerries ... ..	26	29
Dexters ... ..	26	29

Highly commended cards will be given to animals other than prize-winners that reach the above standard.

As many as 92 cows were entered in the Butter Test, as against only 69 in 1912--an increase of 23. Of the 92 entered, only 62

competed for the various prizes offered. This number was made up as follows :—

Pedigree Shorthorns	...	...	...	...	...	17
Non-Pedigree Shorthorns	...	...	...	...	...	9
Lincoln Red Shorthorns	...	...	...	...	...	5
Jerseys	...	...	...	...	...	18
Guernseys	...	...	...	...	...	6
South Devons	...	...	...	...	...	2
Kerries	...	...	...	...	...	5

As in previous years, Wednesday morning's milk was separated as soon as possible after the cows were milked, the evening's milk was similarly treated, and the cream from the latter was added to the morning's cream. The mixed cream was allowed to ripen until Thursday morning, when churning began.

Many of the creams only churned with difficulty, and the loss of fat in the butter-milk was in several instances abnormal. This is what is to be expected in the churning of the cream of many cows which are unnaturally forced for milk production.

The amount of butter yield in 1913 was somewhat lower than was the case in 1912. Over 50 per cent. of the Shorthorns tested in 1912 yielded over 2 lbs. of butter, whereas only 20 per cent. of those tested in 1913 exceeded this amount.

In the Shorthorn class, Mr. Raingill's Ruby yielded slightly over 3 lbs. of butter in 24 hours—1 lb. of butter to every 19·63 lbs. of milk.

In the Jersey class, Mr. J. H. Smith-Barry's Promise was awarded the Gold Medal, her performance being 2 lbs. 10½ ozs. of butter on 41 lbs. 10 ozs. milk—a butter ratio of 1 in 15·76.

Of the six Guernseys tested four exceeded the standard of points for the breed. Only two South Devons competed, and the prize of £3 was awarded to Messrs. Page and Whitley's Sunbeam's Bluebell.

Of five Kerries not one obtained the requisite number of points to qualify for a prize.

In order to enable our readers to compare the results obtained from year to year, we append the following table :—

Year.			Total No. of Cows.	Average weight of 24 hours' Milk.	Average Yield of Butter.	Average Butter Ratio.	Average No. of Points
				lbs.	lbs. ozs.		
1909	..	..	61	42	1 12½	23·51	33·30
1910	..	..	62	44	1 12½	25·03	32·50
1911	..	..	55	43½	1 11	25·87	30·90
1912	..	..	54	49½	1 14½	25·82	33·08
1913	..	..	62	42	1 9½	26·05	29·26

! ! My best thanks are due to my colleagues, Mr. T. W. Hammond and Mr. L. J. Craufurd, representing the Jersey Cattle Society, for the assistance they rendered in the carrying out of the tests.

TABLE I.—NUMBER OF CATTLE TESTED SINCE 1897.

Breed	1897	1898	1899	1900	1901	1902	1903	1904	1905	1906	1907	1908	1909	1910	1911	1912	1913
Shorthorns	9	23	21	22	15	31	18	14	17	22	26	26	19	22	26	30	26
Lincoln Reds	—	—	—	—	—	—	—	—	—	—	7	9	8	8	6	6	5
Jerseys .....	14	17	15	29	25	30	20	12	18	13	13	16	22	18	18	17	18
Guernseys	3	5	4	7	8	1	5	3	3	2	2	2	2	2	1	2	6
Red Polls ...	7	4	9	7	2	6	5	4	11	12	11	3	4	4	1	1	—
Ayrshires ...	3	1	2	—	1	1	—	1	3	2	—	4	—	1	—	4	—
Sth Devons	—	—	—	—	—	—	2	2	3	5	—	—	4	7	2	4	2
Dutch .....	1	—	—	—	—	—	1	—	—	—	—	—	—	—	—	—	—
Kerries and Dexters	—	1	2	—	1	2	—	2	1	2	2	5	2	—	1	—	5
Welsh .....	—	1	1	1	—	—	—	—	—	—	—	—	—	—	—	—	—
Cross-breds	4	1	6	2	2	11	8	6	8	10	—	—	—	—	—	—	—
<b>Total</b>	<b>41</b>	<b>53</b>	<b>60</b>	<b>68</b>	<b>54</b>	<b>82</b>	<b>59</b>	<b>44</b>	<b>64</b>	<b>68</b>	<b>61</b>	<b>65</b>	<b>61</b>	<b>62</b>	<b>55</b>	<b>54</b>	<b>62</b>

TABLE II.—NUMBER OF CATTLE OF THE VARIOUS BREEDS TESTED SINCE 1895, WITH THEIR AVERAGE PERIOD OF LACTATION, WEIGHT OF BUTTER, BUTTER RATIOS, AND POINTS.

Year	No.	Breed	Average No. of Days in Milk	Average Weight of Butter	Average Butter Ratio	Average No. of Points
				lbs. ozs.	lbs.	
From 1895 to 1900	106	Shorthorns ...	50½	1 11	28.81	—
1901 .....	15	" ...	44	2 0½	25.69	33.69
1902 .....	31	" ...	50	1 11½	27.38	23.89
1903 .....	18	" ...	41	1 11	38.59	28.44
1904 .....	14	" ...	41½	1 10	29.31	27.47
1905 .....	17	" ...	53	1 13½	27.65	31.25
1906 .....	22	" ...	58	1 6½	32.87	25.08
1907 .....	26	" ...	62	1 11½	30.23	30.24
1908 .....	*35	" ...	49	1 11	29.39	28.05
1909 .....	19	" ...	54	1 14	27.25	32.31
1910 .....	22	" ...	43	1 13½	27.53	31.39
1911 .....	26	" ...	39	1 12½	28.42	29.28
1912 .....	30	" ...	44	2 0½	26.58	33.75
1913 .....	26	" ...	38	1 10½	31.45	27.54
1907 .....	7	Lincoln Reds	57	1 13½	28.31	31.91
1908 .....	9	" ...	61	1 12	28.00	30.60
1909 .....	8	" ...	44	1 14½	24.81	32.09
1910 .....	8	" ...	79	1 10½	27.15	31.39
1911 .....	6	" ...	78	1 11	27.03	30.97
1912 .....	6	" ...	36	1 14½	26.72	30.62
1913 .....	5	" ...	44	1 13½	27.78	29.72
„ 1895 to 1900	126	Jerseys ...	99	1 10½	19.15	—
1901 .....	25	" ...	141	1 9½	17.80	34.44
1902 .....	30	" ...	124	1 10	18.46	33.19
1903 .....	20	" ...	141	1 11	18.12	36.13
1904 .....	12	" ...	117	1 13½	19.62	36.79
1905 .....	18	" ...	134	1 10½	19.48	35.51
1906 .....	13	" ...	119	1 10½	20.89	33.49
1907 .....	13	" ...	111	1 11	19.71	34.40
1908 .....	16	" ...	115	1 7½	22.35	30.00
1909 .....	22	" ...	116	1 13½	18.36	37.12
1910 .....	18	" ...	123	1 13½	18.43	37.05
1911 .....	18	" ...	116	1 11½	19.98	34.11
1912 .....	7	" ...	143	2 1	18.26	40.77
1913 .....	18	" ...	136	1 10½	19.24	35.85
„ 1895 to 1900	23	Guernseys ...	71½	1 9½	21.86	—
1901 .....	8	" ...	81	1 8½	21.43	29.51
1902 .....	1	" ...	17	1 3½	21.46	19.75
1903 .....	5	" ...	52	1 1	27.77	18.93
1904 .....	3	" ...	98½	1 10	20.65	31.91
1905 .....	3	" ...	165½	1 6½	19.66	31.78
1906 .....	2	" ...	138	1 3½	27.00	28.45

TABLE II.—NUMBER OF CATTLE OF THE VARIOUS BREEDS TESTED SINCE 1895, WITH THEIR AVERAGE PERIOD OF LACTATION, WEIGHT OF BUTTER, BUTTER RATIOS, AND POINTS—*Continued.*

Year	No.	Breed	Average No. of Days in Milk	Average Weight of Butter	Average Butter Ratio	Average No. of Points
				lbs. ozs.	lbs.	
1907 .....	2	Guernseys ...	82	1 12½	18.90	33.48
1908 .....	2	" ...	142	1 13½	19.47	37.90
1909 .....	2	" ...	66	1 9½	21.13	28.27
1910 .....	2	" ...	57	1 3½	26.80	21.93
1911 .....	1	" ...	181	0 14	39.28	26.00
1912 .....	2	" ...	53	1 2½	24.32	20.55
1913 .....	6	" ...	139	1 6½	21.94	30.66
From 1895 to 1900	30	Red Polls ...	60½	1 4½	30.29	—
1901 .....	2	" ...	80	1 8½	25.50	28.77
1902 .....	6	" ...	83	1 6½	26.84	26.92
1903 .....	5	" ...	124	1 0	39.60	21.39
1904 .....	4	" ...	115½	1 5½	30.34	29.06
1905 .....	11	" ...	74½	1 3½	28.78	22.76
1906 .....	12	" ...	76	0 15	39.15	18.81
1907 .....	11	" ...	99	1 2½	33.21	23.96
1908 .....	3	" ...	92	1 1	35.00	22.16
1909 .....	4	" ...	86	1 4½	32.73	25.37
1910 .....	4	" ...	78	1 4½	30.81	24.35
1911 .....	1	" ...	76	0 15	36.60	18.60
1912 .....	1	" ...	26	1 0	43.80	16.00
1913 .....	—	" ...	—	—	—	—
1895 to 1900	8	Ayrshires ...	52	1 13½	26.35	—
1901 .....	1	" ...	125	1 7½	27.65	32.10
1902 .....	1	" ...	33	1 3½	18.00	19.50
1903 .....	—	" ...	—	—	—	—
1904 .....	1	" ...	116	0 12½	35.20	20.10
1905 .....	3	" ...	77	1 2½	28.07	22.88
1906 .....	2	" ...	23	1 11½	25.51	27.70
1907 .....	—	" ...	—	—	—	—
1908 .....	4	" ...	75	1 2	35.19	21.00
1909 .....	—	" ...	—	—	—	—
1910 .....	1	" ...	88	1 15	25.93	35.80
1911 .....	—	" ...	—	—	—	—
1912 .....	4	" ...	71	1 5½	32.52	24.65
1913 .....	—	" ...	—	—	—	—
1909 .....	4	South Devons	105	1 13½	24.77	33.66
1910 .....	7	" ...	91	1 11½	29.33	32.87
1911 .....	2	" ...	144	1 5	38.98	31.52
1912 .....	4	" ...	90	1 15½	26.51	36.74
1913 .....	2	" ...	62	1 8½	30.96	26.50

TABLE 11.—NUMBER OF CATTLE OF THE VARIOUS BREEDS TESTED SINCE 1895, WITH THEIR AVERAGE PERIOD OF LACTATION, WEIGHT OF BUTTER, BUTTER RATIOS, AND POINTS—*Continued.*

Year.	No.	Breed.	Average No. of Days in Milk.	Average Weight of Butter.		Average Butter. Ratio.	Average No. of Points.
				lbs.	ozs.	lbs.	
From 1895 to 1900	3	Dexters and Kerries	117	0	14 $\frac{3}{4}$	40.80	—
1901 .....	1	" ...	83	1	6 $\frac{1}{4}$	21.17	26.55
1902 .....	2	" ...	46	1	7 $\frac{1}{8}$	21.28	23.49
1903 .....	—	" ...	—	—	—	—	—
1904 .....	2	" ...	72	0	14 $\frac{3}{4}$	21.31	18.45
1905 .....	1	" ...	149	1	1 $\frac{1}{2}$	23.47	28.15
1906 .....	2	" ...	33	1	13	22.40	29.10
1907 .....	2	" ...	65	1	11 $\frac{1}{4}$	21.06	29.70
1908 .....	5	" ...	124	1	6	24.47	29.13
1909 .....	2	Kerries ...	75	1	6	20.86	25.65
1910 .....	—	" ...	—	—	—	—	—
1911 .....	1	" ...	162	1	3 $\frac{1}{2}$	28.51	31.50
1912 .....	—	" ...	—	—	—	—	—
1913 .....	5	" ...	43	1	3	25.98	19.70

TABLE III.—AVERAGE YIELD OF BUTTER OF THE DIFFERENT BREEDS AT DIFFERENT PERIODS.

Year	Breed	No. of Cows	Days in Milk, 50	No. of Cows	Days in Milk, 100	No. of Cows	Days in Milk, 135	No. of Cows	Days in Milk, 190
1895 to			lbs. ozs.		lbs. ozs.		lbs. ozs.		lbs. ozs.
1900	Shorthorns	19	1 12½	6	1 7½	2	1 4½	8	1 1½
1901	"	2	1 8	—	—	1	2 6	—	—
1902	"	6	1 10½	—	—	1	1 11	—	—
1903	"	3	1 7	—	—	1	1 6½	—	—
1904	"	3	1 10½	1	1 14½	—	—	—	—
1905	"	2	1 1	1	2 0½	2	1 7½	—	—
1906	"	11	1 8½	3	1 3½	—	—	—	—
1907	"	11	1 9½	2	1 9½	1	0 15½	—	—
1908	"	11	1 11½	—	—	2	1 12	—	—
1909	"	11	2 0½	5	1 11½	3	1 8½	—	—
1910	"	16	1 14½	5	2 1	1	1 3½	—	—
1911	"	20	1 13	6	1 9½	—	—	—	—
1912	"	23	2 2½	6	1 8½	1	1 14	—	—
1913	"	20	1 11	5	1 8½	1	1 5	—	—
1907	Lincoln Reds	3	1 12	1	1 11	—	—	—	—
1909	"	6	2 1	1	1 9½	1	1 7	—	—
1910	"	4	1 10½	—	—	3	1 10½	1	1 13½
1911	"	4	1 10½	—	—	—	—	2	1 12
1912	"	5	1 15½	1	1 8½	—	—	—	—
1913	"	5	1 13½	—	—	—	—	—	—
1895 to									
1900	Jerseys	23	1 10½	15	1 8½	11	1 8½	31	1 10½
1901	"	1	1 12	8	1 7½	6	1 9	12	1 10½
1902	"	4	1 9½	3	1 8½	2	1 14	9	1 11
1903	"	4	1 9½	5	1 15	9	1 9½	2	1 9½
1904	"	2	1 10½	3	2 2½	4	2 0½	1	1 13½
1905	"	3	1 8½	4	1 15½	8	1 9½	2	1 8½
1906	"	5	1 10½	3	1 3½	4	1 15½	1	1 5½
1907	"	6	1 13½	2	1 7½	3	1 13	1	1 4½
1908	"	4	1 14½	3	1 10	4	1 1	2	1 2
1909	"	3	1 3	4	2 2½	6	1 14½	9	1 12
1910	"	2	1 10½	5	1 13½	2	1 15½	7	1 13½
1911	"	3	1 0½	6	1 11	1	2 5½	4	1 12½
1912	"	—	—	2	1 8½	2	2 1	—	—
1913	"	1	1 5½	5	1 11	1	1 12	8	1 7
1895 to									
1900	Guernseys	3	1 7½	4	1 7½	3	1 4½	1	1 8
1901	"	1	1 15½	2	1 5½	—	—	2	1 8½
1902	"	—	—	—	—	—	—	—	—
1903	"	2	0 15½	—	—	—	—	—	—
1904	"	2	1 6½	—	—	1	2 0½	—	—
1905	"	1	1 10½	—	—	1	1 12½	1	0 13½
1906	"	—	—	1	1 1	1	1 5½	—	—
1907	"	—	—	—	—	—	—	1	1 14
1908	"	1	1 13	—	—	—	—	1	1 14
1909	"	1	1 11	1	1 8½	—	—	—	—
1910	"	1	1 3½	1	1 3½	—	—	—	—
1911	"	—	—	—	—	—	—	1	0 14
1912	"	1	1 3	1	1 2	—	—	—	—
1913	"	1	1 8	1	1 6½	1	1 12	—	—



TABLE III.—AVERAGE YIELD OF BUTTER OF THE DIFFERENT  
BREEDS AT DIFFERENT PERIODS—*Continued.*

Year	Breed	No. of Cows	Days in Milk, 50	No. of Cows	Days in Milk, 100	No. of Cows	Days in Milk, 135	No. of Cows	Days in Milk, 190
1895 to			lbs. ozs.		lbs. ozs.		lbs. ozs.		lbs. ozs.
1900	Red Polls	10	1 4½	2	1 8	2	0 12½	1	0 11
1901	"	—	—	2	1 8½	—	—	1	—
1902	"	—	—	3	1 8	—	—	—	1 2¼
1903	"	1	0 13½	1	1 1¼	—	—	1	0 13
1904	"	1	1 13	2	1 1	1	1 7½	—	—
1905	"	3	1 1	2	1 5	—	—	1	0 12
1906	"	7	1 0	—	—	2	0 14½	—	—
1907	"	5	1 4	—	—	4	1 1½	—	—
1908	"	1	1 2¼	—	—	—	—	1	1 1
1909	"	1	1 12	1	1 2½	1	1 0½	1	0 12½
1910	"	2	1 3½	1	1 9½	—	—	1	1 2¼
1911	"	—	—	1	0 15	—	—	—	—
1912	"	1	1 0	—	—	—	—	—	—
1913	"	—	—	—	—	—	—	—	—
1908	Ayrshires	—	—	—	—	—	—	1	0 12
1909	"	—	—	—	—	—	—	—	—
1910	"	—	—	1	1 15	—	—	—	—
1911	"	—	—	—	—	—	—	—	—
1912	"	2	1 4½	2	1 6½	—	—	—	—
1913	"	—	—	—	—	—	—	—	—
1909	South Devons	1	2 5½	1	1 1½	—	—	2	1 11½
1910	"	1	2 5½	4	1 11½	1	2 0	1	0 12½
1911	"	—	—	—	—	—	—	2	1 5
1912	"	2	2 0½	—	—	1	2 3½	1	1 10½
1913	"	1	2 3½	1	0 13	—	—	—	—
1908	Kerries & Dexters	—	—	—	—	1	0 14	2	1 2
1909	"	1	1 5	—	—	1	1 7	—	—
1910	"	—	—	—	—	—	—	—	—
1911	"	—	—	—	—	—	—	1	1 3½
1912	"	—	—	—	—	—	—	—	—
1913	"	4	1 4½	1	0 13½	—	—	—	—

TABLE IV.—COMPARISONS OF CHURNINGS WITH ANALYSES.  
SHORTHORNS.

No. in Catalogue	Weight of Butter Churned		Total Fat by Analyses		No. in Catalogue	Weight of Butter Churned		Total Fat by Analyses	
	lbs.	ozs.	lbs.	ozs.		lbs.	ozs.	lbs.	ozs.
12	1	12 $\frac{1}{2}$	2	0 $\frac{3}{4}$	37	1	7 $\frac{1}{4}$	1	7
16	1	3 $\frac{1}{2}$	1	4	38	1	7 $\frac{1}{4}$	1	0 $\frac{3}{4}$
17	2	0 $\frac{3}{4}$	2	2	41	1	12 $\frac{1}{2}$	1	12
19	1	12	1	12 $\frac{1}{2}$	65	1	4 $\frac{1}{2}$	1	5
22	1	8 $\frac{1}{2}$	1	8 $\frac{1}{2}$	72	0	13 $\frac{1}{2}$	1	12 $\frac{1}{2}$
24	1	11 $\frac{1}{2}$	1	3	77	1	8 $\frac{1}{4}$	2	2
27	1	9 $\frac{1}{2}$	2	2 $\frac{1}{2}$	80	1	4	2	1 $\frac{1}{2}$
28	1	15	2	1	81	2	2 $\frac{1}{2}$	2	5 $\frac{1}{2}$
29	1	11 $\frac{1}{2}$	1	11	83	3	0 $\frac{1}{2}$	3	4
31	1	10 $\frac{1}{2}$	1	10 $\frac{1}{4}$	87	2	0	2	1
32	1	9 $\frac{3}{4}$	1	12 $\frac{1}{4}$	91	1	11	1	14
34	1	9 $\frac{1}{2}$	1	9	93	1	5	1	9 $\frac{1}{2}$
35	1	5 $\frac{1}{4}$	1	14	94	1	11 $\frac{1}{4}$	2	15
						43	0 $\frac{1}{2}$	48	11

## LINCOLNSHIRE RED SHORTHORNS.

112	2	3 $\frac{1}{4}$	2	0	115	1	12 $\frac{1}{4}$	1	12
113	1	8 $\frac{1}{4}$	1	7 $\frac{1}{4}$	118	1	6 $\frac{1}{4}$	1	8
114	2	2 $\frac{1}{4}$	1	15		9	2	8	10 $\frac{1}{2}$

## JERSEYS.

126	1	7 $\frac{1}{2}$	1	7 $\frac{1}{2}$	138	1	12	1	11
128	1	10 $\frac{1}{2}$	1	9 $\frac{1}{4}$	139	1	15 $\frac{1}{4}$	1	14 $\frac{1}{4}$
129	1	4 $\frac{1}{2}$	1	3	141	1	7 $\frac{1}{4}$	1	7
130	1	14 $\frac{1}{2}$	1	13 $\frac{1}{2}$	147	1	3 $\frac{1}{4}$	Analyses not obtained.	
131	1	14 $\frac{1}{4}$	1	13	148	1	6 $\frac{1}{4}$		
134	1	5 $\frac{1}{2}$	1	2	149	1	1 $\frac{1}{2}$		
135	2	9 $\frac{1}{2}$	2	8 $\frac{1}{4}$	153	1	5		
136	2	10 $\frac{1}{4}$	2	5	165	1	0 $\frac{1}{2}$		
137	2	2	2	1	166	1	5 $\frac{1}{4}$	20	14 $\frac{1}{2}$
						29	8 $\frac{3}{4}$		

Omitting Nos. 147-166 (inclusive), the weight of butter is 22 lbs. 2 $\frac{1}{4}$  ozs.

## GUERNSEYS.

182	1	10 $\frac{3}{4}$	1	11 $\frac{1}{4}$	187	1	12	1	10
184	1	8	1	13	189	1	6 $\frac{1}{4}$	1	5 $\frac{1}{2}$
185	0	15 $\frac{1}{4}$	1	2	196	1	2 $\frac{1}{4}$		
						8	7 $\frac{1}{4}$	7	9 $\frac{1}{4}$

Omitting No. 196.

## SOUTH DEVONS.

227	0	13	1	7	228	2	3 $\frac{1}{2}$	2	5
						3	0 $\frac{1}{2}$	3	12

## KERRIES.

229	1	7 $\frac{1}{2}$	1	11	232	1	0 $\frac{1}{4}$	0	18 $\frac{1}{4}$
230	1	0 $\frac{3}{4}$	1	1	233	1	9	1	9
231	0	13 $\frac{1}{2}$	0	13 $\frac{1}{4}$		5	15	6	13 $\frac{1}{2}$

TABLE V.—AVERAGE DIFFERENCES BETWEEN CHURNINGS AND  
CHEMICAL ANALYSES FROM 1898 TO 1913 INCLUSIVE.

Year	Breed	Churn	Analyses
		Lbs. Butter	Lbs. Fat
1898	Shorthorns ... ..	38.92	36.82
1899	" ... ..	34.34	32.46
1900	" ... ..	35.55	37.87
1901	" ... ..	29.05	27.80
1902	" ... ..	53.48	55.91
1903	" ... ..	30.72	35.92
1904	" ... ..	22.98	26.59
1905	" ... ..	30.89	30.58
1906	" ... ..	31.38	33.59
1907	" ... ..	45.14	47.79
1908	" ... ..	43.74	49.78
1909	" ... ..	35.06	35.91
1910	" ... ..	41.62	44.75
1911	" ... ..	47.79	48.00
1912	" ... ..	61.10	63.85
1913	" ... ..	43.01	48.69
1907	Lincolnshire Red Shorthorns ...	12.94	12.31
1908	" " " ...	15.79	15.56
1909	" " " ...	14.06	13.48
1910	" " " ...	13.37	13.62
1911	" " " ...	10.16	10.00
1912	" " " ...	11.47	12.00
1913	" " " ...	9.12	8.65
1898	Jerseys ... ..	29.15	27.26
1899	" ... ..	23.61	22.54
1900	" ... ..	39.75	39.32
1901	" ... ..	33.19	31.82
1902	" ... ..	43.61	41.03
1903	" ... ..	27.04	26.41
1904	" ... ..	22.22	22.06
1905	" ... ..	24.53	22.44
1906	" ... ..	19.56	18.71
1907	" ... ..	22.64	—
1908	" ... ..	22.25	—
1909	" ... ..	37.65	35.89
1910	" ... ..	*30.37	30.18
1911	" ... ..	27.62	26.18
1912	" ... ..	14.39	13.39
1913	" ... ..	29.54	†20.90
1898	Guernseys ... ..	18.07	8.25
1899	" ... ..	15.90	5.53
1900	" ... ..	0.84	11.16
1901	" ... ..	2.46	11.59
1902	" ... ..	1.23	1.34
1903	" ... ..	5.34	6.47
1904	" ... ..	4.89	4.94
1905	" ... ..	3.42	3.42
1906	" ... ..	2.41	1.82
1907	" ... ..	3.54	3.22
1908	" ... ..	3.69	3.52

\* Excluding Nos. 142 and 146.

† Does not include the fat of Jersey Heifers competing in the Tests.

TABLE V.—AVERAGE DIFFERENCES BETWEEN CHURNINGS AND CHEMICAL ANALYSES FROM 1898 TO 1913 INCLUSIVE—*Continued.*

Year	Breed	Churn	Analyses
		Lbs. Butter	Lbs. Fat
1909	Guernseys ... ..	3.20	3.52
1910	" ... ..	2.44	2.81
1911	" ... ..	.87	1. 5
1912	" ... ..	2.31	2.96
1913	" ... ..	†8.48	7.59
1898	Red Polls ... ..	5.04	5.56
1899	" ... ..	8.48	8.33
1900	" ... ..	8.98	9.81
1901	" ... ..	3.07	2.88
1902	" ... ..	8.36	8.00
1903	" ... ..	5.01	6.95
1904	" ... ..	5.39	6.00
1905	" ... ..	13.42	14.53
1906	" ... ..	11.39	14.50
1907	" ... ..	12.53	16.08
1908	" ... ..	3.21	4.06
1909	" ... ..	5.09	5.71
1910	" ... ..	5.12	6.25
1911	" ... ..	.94	1.08
1912	" ... ..	1.0	1.31
1910	Ayrshires ... ..	1.94	1.75
1912	" ... ..	5.37	5.89
1909	South Devons ... ..	6.89	7.03
1910	" ... ..	12.03	13.06
1911	" ... ..	2.64	3.25
1912	" ... ..	7.92	8.39
1913	" ... ..	3.01	3.75
1907	Kerries ... ..	3.40	3.19
1908	Kerries and Dexters ... ..	6.89	7.09
1909	Kerries ... ..	2.75	2.64
1911	" ... ..	1.21	.96
1913	" ... ..	5.94	6.10

† Does not include the fat of Guernsey Heifers competing in the Tests.

## BUTTER TESTS—JERSEYS.

No. in Catalogue	Exhibitor and Name of Cow	Date of Birth	Date of last Calf	No. of Days in milk	Milk yield in 24 hrs.	Butter Yield	Ratio, viz. lbs. milk to lbs. butter.	Colour	Quality of Butter	No. of Points for butter	No. of Points for period of Lactation	Total number of Points	Awards
			1913		lbs oz lbs oz								
136	J. H. Smith-Barry's Promise...	April 30, 1906	Mar. 12	224	41 1	2	104 15 76	V. Gd.	Ex.	42-25	12-00	54-25	Gold Medal.
135	J. H. Smith-Barry's Malmsey ...	Aug. 12, 1905	April 21	184	45	8	94 17 43	V. Gd	V. Gd.	41-75	12-00	53-75	Silver Medal.
139	J. Carson's Pamela 2nd ...	Jan. 26, 1909	Mar. 21	215	37	10 1	154 19 26	Good	V. Gd.	31-25	12-00	43-25	Bronze Medal.
130	J. Brutton's Irish Lass ...	Aug. 12, 1904	Mar. 18	218	37	0 1	144 19 25	Good	V. Gd	30-75	12-00	42-75	Certificate of Merit
131	Mrs. Evelyn's Catrin ...	April 16, 1910	July 28	86	32	0 1	144 16 45	Good	V. Gd.	30-75	4 60	35-35	Certificate of Merit
137	J. H. Smith-Barry's Nerine ...	April 28, 1908	Aug. 17	66	40	8 2	19 05	V. Gd.	V. Gd.	34-00	2 60	36-60	Certificate of Merit
138	J. Carson's Loulah 3rd ...	Oct. 17, 1904	July 2	112	40	2 1	22 42	Good	V. Gd.	28-00	7-20	35-20	Certificate of Merit
147	Lady Wernher's Outnow's Fairy ...	Feb. 25, 1911	April 18	187	19	4 1	31 16 46	Good	Good	19-25	12 00	31-25	Certificate of Merit
148	Viscount Enfield's Bella ...	Dec. 13, 1910	May 30	145	22	0 1	64 15 44	Pale	V. Gd.	22-50	10-50	33-00	Certificate of Merit
153	J. H. Smith-Barry's Last of the Lilies	Mar. 2, 1911	May 8	167	32	0 1	5 24 38	V. Gd.	Fair	21-00	12-00	33-00	Certificate of Merit
126	Earl Cadogan's Roseleaf ...	July 11, 1906	May 29	146	27	0 1	74 18 38	Good	Good	23-50	10-40	34-10	—
128	Mrs. Bradish-Ellame's Eva Garrick	Feb. 23, 1907	Aug. 4	79	31	6 1	104 18-94	Ex.	V. Gd.	26-50	3-90	30-40	—

## BUTTER TESTS—JERSEYS—Continued.

Catalogue No. in	Name of Cow	CHURNING—TIME AND TEMPERATURE					
		Churning began	Time Churning finished	Duration of Churning	Pairs	Temperature Cream and Churn	Buttermilk when finished churning
				Minutes	Degrees	Degrees	Degrees
129	Aleonora 4th	9 55 a.m.	10 50 a.m.	55	60	52	58
134	La Franchise 3rd	10 11 "	11 0 "	49	60	52	58
141	Stockwell's Maiden	11 30 "	12 4 p.m.	64	64	52	58
149	Circe	12 4 p.m.	1 12 "	68	64	52	52
165	Exempt	12 21 "	1 5 "	44	65	52	60
166	My Pallas	12 28 "	1 23 "	55	65	52	59

## BUTTER TESTS—JERSEYS—Continued.

No. in Catalogue	Name of Cow	CHURNING—TIME AND TEMPERATURE.				Temperature		
		Time		Duration of Churning	Dairy	Cream and Churn	Buttermilk, when churning finished	Degrees
		Churning began	Churning finished					
				Minutes	Degrees	Degrees	Degrees	Degrees
136	Promise ... ..	10 50 a.m.	11 15 a.m.	25	64	52	55	55
135	Malmsey ... ..	10 35 "	11 5 "	34	64	52	54	54
139	Pamela 2nd... ..	11 20 "	12 3 "	43	65	52	57	57
130	Irish Lass ... ..	10 0 "	10 50 "	50	62	52	54	54
131	Catrin ... ..	10 13 "	10 45 "	32	62	52	56	56
137	Nerine ... ..	11 0 "	11 40 "	40	65	52	57	57
138	Loulah 3rd ... ..	11 5 "	11 50 "	45	65	52	57	57
147	Cutnow's Fairy ... ..	11 40 "	12 15 p.m.	35	64	52	58	58
148	Bella ... ..	11 45 "	12 30 "	45	64	52	58	58
153	Last of the Lilies ... ..	12 15 p.m.	1 0 "	45	65	52	58	58
126	Roseleaf ... ..	9 45 a.m.	10 15 a.m.	30	60	52	55	55
128	Eva Garrick ... ..	9 50 "	10 30 "	40	60	52	57	57

## BUTTER TESTS—JERSEYS—Continued.

No. in Catalogue	Exhibitor and Name of Cow	Date of Birth	Date of last Calf	No. of Days in Milk	Milk yield in 24 hrs.	Butter Yield	Ratio, viz., lbs. milk to lbs. butter	Colour and Quality of Butter	No. of Points for butter	No. of Points for lactation.	Total number of Points	Awards	
			1913		lbs ozs lbs ozs			Colour	Quality				
129	Mrs. S. A. Towler's Aleonora 4th...	Jan. 7, 1910	Aug. 8	75	29 2 1	4 1	22-45	V. Pale	Good	20-75	3-50	24-25	—
134	A. Miller-Hallett's La Franchise 3rd	Mar. 14, 1907	April 28	177	29 8 1	5 1	21-95	Good	V. Gd.	21-50	12-00	33-50	—
141	J. Carson's Stockwell's Maiden	Feb. 23, 1910	Aug. 22	61	28 12 1	7 1	19-36	Good	V. Gd.	23-75	2-10	25-85	—
149	Viscount Enfield's Circe ...	Mar. 11, 1911	June 6	138	23 4 1	1 1	21-25	Pale	Good	17-50	9-80	27-30	—
165	Lady Wernher's Exempt...	Sept. 26, 1910	May 30	145	19 0 1	0 1	18-42	Pale	Good	16-50	10-50	27-00	—
166	A. Miller-Hallett's My Pallas...	Sept. 22, 1910	Sept. 20	32	33 0 1	5 1	24-84	Good	V. Gd.	21-25	nil	21-25	—



## BUTTER TESTS—OTHER BREEDS.

No. in Catalogue	Exhibitor and Name of Cow	Date of Birth	Date of Last Calf	Days in Milk		Milk Yield		Butter Yield	Ratio, viz., lbs. Milk to lbs. Butter	Colour	Colour and Quality of Butter.	No. of Points for Butter	No. of Points for Lactation	Total number of Points	Awards									
				Morn.	Even.	Total																		
1913																								
182	Sir H. F. Lennard's Wickham Fancy 2nd	Nov. 3, 1906	Mar.	26	209	16	14	14	31	12	1	10	19	00	Ex.	26	75	12	00	38	75	Prize of £3.		
184	G. Oakey's Brittleware	Apr. 24, 1910	Sept.	26	26	20	0	20	0	40	0	1	8	21	66	V. Gd.	Good	24	00	—	24	00		
185	G. Oakey's Brittleware Ivy Edith	Jan. 28, 1906	April	9	196	10	14	9	11	20	9	0	15	20	88	Good	Good	15	75	12	0	27	75	
187	H. Fitzwalter Pump- tre's Donnington Juno	Oct. 8, 1909	July	6	108	23	0	18	2	41	2	1	12	23	50	Good	V. Gd.	28	00	6	80	34	80	Prize of £1.
189	F. H. Norman's	Dec. 26, 1909	July	20	94	15	11	11	14	27	9	1	6	19	39	Good	V. Gd.	22	75	5	40	28	15	H. Commended.
196	F. H. Norman's	Dec. 4, 1910	April	3	201	14	8	10	10	25	2	1	24	21	73	Good	V. Gd.	18	50	12	0	30	50	H. Commended.
227	Andrew Roger's Dahlia 2nd	April 10, 1904	July	30	84	23	5	20	0	43	5	0	13	53	31	Good	Good	13	00	4	40	17	40	
228	Page and Whitley's Sunbeam's Bluebell	Sept. 30, 1905	Sept.	11	41	27	2	23	8	50	10	2	34	22	81	Pale	V. Gd.	35	50	0	10	35	60	Prize of £3.
229	L. Currie's Minley Princess	April, 1909	Sept.	29	23	21	14	20	10	42	8	1	7	28	94	Fair	Good	23	50	—	23	50		
230	Skidmore Ashby's Rivernook Jose	1910	Sept.	10	42	14	5	12	6	26	11	1	0	25	49	Fair	V. Gd.	16	75	0	20	16	95	
231	Skidmore Ashby's Rivernook Betty	1909	Aug.	15	68	10	8	13	19	5	0	13	15	48	Fair	V. Gd.	13	50	2	80	16	30		
232	Skidmore Ashby's Rivernook Minnie	1910	Sept.	11	41	11	6	9	8	20	14	1	0	20	55	Pale	Poor	16	25	0	10	16	35	
233	T. Waite's Rabeny	April 9, 1904	Sept.	8	44	23	8	20	10	44	2	1	9	28	24	Good	V. Gd.	25	00	0	40	25	40	

## BUTTER TESTS—SHORTHORNS

No. in Catalogue	Exhibitor and Name of Cow.	Date of Birth	Date of last Calf	No. of Days in milk		Milk Yield		Butter Yield	Ratio, viz., lbs. milk to lbs. butter.	Colour and Quality of Butter		No. of Points for butter	No. of Points for lactation	Total number of Points	Awards
				Morn.	Even	Total	lbs. ozs. lbs. ozs. lbs. ozs.			Colour	Quality				
12	Maj.-General Brocklehurst's Rankenborough Calceolaria	May 7, 1907	Oct.	3	19.23	13.21	5.45	21	12½	25.33	Pale	Soft	28.50	—	29.50
16	Samuel Sanday's Mary of Heggie 2nd	Jan. 1, 1904...	Aug.	4	79.18	3.21	11.39	141	34	37.71	Fair	Good	19.50	3.90	23.40
17	Samuel Sanday's Greenleaf 32nd	Jan. 24, 1906	Sept.	28	24.27	2.29	11.56	132	0½	27.76	Fair	Good	32.75	—	32.75, 5th Prize
19	R. W. Hobbs & Sons' Rose 44th	Nov. 17, 1907	Aug.	27	56.33	5.31	11.65	01	12	37.14	V. Fair	Soft	28.00	1.60	29.60
22	J. Ellis Potter's Hambleton Oxford Duchess	Mar. 25, 1904	Aug.	26	57.28	2.25	0.53	21	8½	41.46	Good	Good	24.50	1.70	26.20
24	J. Ellis Potter's Lady Clara	Nov. 10, 1905	Sept.	18	34.30	11.34	0.64	111	11½	37.64	Good	Good	27.50	—	27.50
27	J. Moffat's Daisy 5th	Aug. 2, 1908	Sept.	20	32.29	11.24	3.53	141	9½	33.39	V. Poor	V. Poor	25.75	—	25.75
28	J. Moffat's Mermaid 2nd	April 13, 1906	Oct.	2	20.26	2.21	14.48	01	15	24.77	Poor	Poor	31.00	—	31.00
29	H. Fitzherbert Wright's Daffodil	April 21, 1904	Sept.	16	36.23	13.20	5.44	21	11½	25.44	Pale	Good	27.75	—	27.75
31	H. Fitzherbert Wright's Georgie Cran 2nd	Nov. 20, 1906	Aug.	18	65.26	0.23	8.49	81	10½	29.89	Good	Good	26.50	2.50	29.00
32	H. Fitzherbert Wright's Red Rose A 2nd	Feb. 27, 1907	Sept.	23	29.26	2.25	6.51	81	9½	32.00	Good	Good	25.75	—	25.75
34	G. B. Nelson's Barbara 6th	Feb. 2, 1907	Sept.	17	35.21	5.23	11.45	01	9½	28.23	Good	Good	25.50	—	25.50
35	G. B. Nelson's Barbara 5th	Jan. 7, 1906	Sept.	25	27.30	3.25	6.55	91	5½	40.89	V. Good	Good	21.75	—	21.75
37	J. L. Shirley's Carrie 56th	Aug. 3, 1908	Aug.	4	73.20	8.19	6.39	141	71	27.44	Good	Pale	23.25	3.90	27.15
38	J. L. Shirley's Rollbright 4th	Feb. 15, 1910	Oct.	5	17.17	11.16	3.33	141	7½	23.06	Poor	Pale	23.50	—	23.50

Bridget

## BUTTER TESTS—SHORTHORNS—Continued.

No. in Catalogue.	Exhibitor and Name of Cow	Date of Birth	Date of last Calf	No. of days in milk			Milk Yield.		Butter Yield	Ratio, viz., lbs. milk to lbs. butter	Colour and Quality of Butter		No. of Points for butter	No. of Points for lactation	Total number of Points	Awards	
				Morn.	Even.	Total	lbs. ozs.	lbs. ozs.			Colour	Quality					
41	Mrs. E. Britten's Honey-bourne Snowdrop	June 30, 1907	Sept. 30	22 22	3 21	5 43	8 1	12 1	24 42	V. Good	V. Good	28 50	—	—	—	28 50	
65	Cambs. University Farm's Cantab Gwynne	Jan. 15, 1911	Sept. 30	22 17	8 16	14 34	6 1	4 1	26 82	Good	Good	20 50	—	—	—	20 50	
72	G. B. Nelson's Milkmaid	—	Oct. 4	18 23	2 21	6 44	8 0	13 1	52 74	Fair	V. Poor	13 50	—	—	—	13 50	
77	A. P. Brandt's Primrose	9 yrs., 6 mos.	Sept. 3	49 34	6 28	6 62	12 1	8 1	41 40	V. Good	V. Good	24 25	0 90	25 15	—	25 15	
80	J. W. Astley's Southfield Red Rose	8 1/2 years	Oct. 5	17 20	14 23	0 43	14 1	4	35 10	V. Poor	V. Bad	20 00	—	—	—	20 00	
81	J. W. Astley's Southfield Dora	About 6 yrs.	Sept. 21	31 34	3 31	0 65	3 2	2 1	30 23	Good	V. Poor	34 50	—	—	—	34 50	4th Prize
83	Sam S. Raingill's Ruby	5 years	Sept. 28	24 30	14 28	10 59	8 3	0 1/2	19 63	V. Good	Fair	48 50	—	—	—	48 50	1st Prize, Silver Medal and Nelson Cup
87	Hooker & Whitcome's Duchess	—	Sept. 20	32 31	10 32	2 63	12 2	0	31 87	Pale	V. Good	32 00	—	—	—	32 00	
91	J. L. Shirley's Silvertown Fill-pail	About 7 yrs.	Oct. 2	20 33	2 31	11 64	13 1	11	45 06	Pale	V. Bad	31 00	—	—	—	31 00	
93	J. L. Shirley's Silvertown Mildred	About 6 yrs.	June 23	12 26	2 27	0 33	2 1	5	40 48	Pale	Good	21 00	8 10	29 10	—	29 10	
94	F. B. Wilkinson's Sherwood Rose 2nd	—	Sept. 29	23 37	3 33	14 71	1 1	11 1/4	41 72	V. Good	Fair	27 25	—	—	—	27 25	
112	C. E. Scorer's Bracebridge Rose 189	Jan. 30, 1903	Sept. 11	41 34	5 29	6 63	11 2	3 1	28 91	V. Pale	Fair	35 25	0 10	35 35	3rd Prize		
113	C. E. Scorer's Bracebridge 188a	May 15th, 1908	Sept. 7	45 24	10 20	3 44	13 1	8 1/2	29 27	V. Pale	Fair	24 50	0 50	25 00	—	25 00	
114	John Evens' Burton Irene	Aug., 1909	Aug. 31	32 27	13 23	5 51	2 2	2 1/2	23 54	Pale	Good	34 75	1 20	35 95	2nd Prize and Bronze Medal		
115	John Evens' Burton Ruby	Sept. 2, 1909	Sept. 16	36 30	10 26	8 37	2 1	12 1/2	31 79	Pale	Fair	28 75	—	28 75	—	28 75	
118	John Evens' Happy Returns...	Nov. 9, 1904	Sept. 4	48 20	0 16	10 36	10 1	6 1/2	25 76	Pale	Fair	22 75	0 80	23 55	—	23 55	

## BUTTER TEST—SHORTHORNS—Continued.

No. Catalogue.	Name of Cow	CHURNING—TIME AND TEMPERATURE.				
		Time		Temperature		
		Churning began	Churning flushed	Duration of Churning Minutes	Dairy Degrees	Cream and Churn Degrees
12	Rank-borough Calceolaria ..	8 30 a.m.	9 0 a.m.	30	57	52
16	Mary of Heggle 2nd ..	8 40	9 0	20	58	54
17	Greenleaf 32nd ..	8 45	9 10	25	58	55
19	Rose 44th ..	8 40	9 20	40	58	52
22	Hambleden Oxford Duchess	8 49	9 43	54	59	55
24	Lady Clara ..	8 53	9 32	37	59	53
27	Daisy 5th ..	8 52	9 5	13	59	54
28	Mermaid 2nd ..	8 50	9 5	15	59	54
29	Daffodil ..	8 55	9 21	26	59	52
31	Georgie Cran 2nd ..	9 23	10 13	50	59	52
32	Red Rose A 2nd ..	9 5	9 20	15	59	53
34	Barbara 6th ..	9 28	10 43	75	59	58
35	Barbara 5th ..	9 0	9 37	37	59	54
37	Carrie 65th ..	9 8	9 44	36	59	55
38	Rollbright Bridget ..	9 34	10 1	27	59	55
41	Honeybourne Snowdrop	9 50	10 15	25	59	54
65	Cantab Gwynne ..	9 1	10 32	91	61	54
72	Milkmaid ..	10 6	10 20	14	61	54
77	Primrose ..	10 35	11 12	37	61	56
80	Southfield Red Rose	10 39	11 0	21	61	53
81	Southfield Dora ..	10 52	11 10	18	61	55
83	Ruby ..	10 46	11 14	28	61	56
87	Duchess ..	10 55	11 23	28	61	54
91	Silverton Fillpail ..	10 56	11 48	52	61	56
93	Silverton Mildred ..	11 57	12 56 p.m.	59	61	60
94	Sherwood Rose 2nd ..	11 55	12 24	29	62	54
112	Bracebridge 189 ..	12 0	12 42	42	62	56
113	Bracebridge 188B ..	11 59	12 41	42	62	54
114	Burton Irene ..	12 5 p.m.	12 32	27	62	53
115	Burton Ruby 15th ..	12 5	12 49	44	62	55
118	Happy Returns ..	12 22	12 42	20	62	55

## BUTTER TESTS—OTHER BREEDS.

No. in Catalogue	Name of Cow	CHURNING—TIME AND TEMPERATURE.				
		Time		Temperature		
		Churning began	Churning finished	Duration of Churning	Dairy	Buttermilk, when churning finished
				Minutes	Degrees	Degrees
182	Wickham Fancy 2nd	12 41 p.m.	1 13 p.m.	32	62	56
184	Brittleware Ivy	12 36 "	12 57 "	21	62	53
185	Brittleware Edith	12 52 "	1 53 "	61	62	56
187	Donnington Juno	12 58 "	1 32 "	34	63	56
189	Hayes Nellie 7th	1 2 "	1 42 "	40	63	55
196	Goldstream 5th	1 11 "	1 31 "	20	65	55
227	Dahlia 2nd...	1 25 "	2 7 "	42	63	60
228	Sunbeam's Bluebell	1 27 "	2 7 "	40	63	58
229	Minley Princess	1 37 "	2 23 "	46	65	58
230	Rivernook José	1 35 "	2 4 "	29	65	56
231	Rivernook Betty	1 38 "	2 23 "	45	65	56
232	Rivernook Minnie	1 5 "	1 50 "	45	63	58
233	Rabeny	1 0 "	1 35 "	35	63	56

## THE POULTRY SECTION.

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By L. C. VERREY, The Warren, Oxshott, Surrey.

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It has been my privilege for several years to have the honour of reporting on the Poultry Section of the Dairy Show, and a very agreeable and pleasant task it has always been, because of the continuous advancement, combined with the repeated success of the Show, material facts not a little aided by the kindly and keen interest taken in this particular department by all connected with the British Dairy Farmers' Association.

When writing last year, I ventured to say that I could then state without fear of contradiction that the galleries of the Agricultural Hall had never been more thronged with people than on the second afternoon and evening of that Show; but now that remark must be taken as quite a thing of the past, for the record created in 1912 has been easily broken by that of 1913. To say that the place was crowded conveys little, for all the first three days it was literally packed with visitors eager to see the wonderful and magnificent display of the choicest poultry ever got together at Islington. Thirteen is generally considered an unlucky number, but evidently with nineteen hundred before, it transforms it into an especially lucky one, for the Dairy Show of 1913 will ever be known as the record breaker, the entries in all sections being far in excess of any previous year.

The poultry section was in no way behind in adding to the general increase, for it contributed no less than 500 entries in excess of 1912, truly a fitting compliment to the worthy President of the Association, Mr. S. Palgrave Page, who has been for so long Chairman of the Poultry and Pigeon Committee.

The grand total of 3,840 exhibits of live and dead poultry naturally made a splendid display; but though the 3,840 was the official number of entries, as printed in the catalogue, it must not be taken as the precise number of specimens on view, because, for instance with the table poultry and dead rabbits, the exhibits were in duplicate, the pair counting as one entry, whilst in the case of the breeding pens each contained four birds, which again simply count one entry, being all under one number. Taking all these matters into consideration, there were really 4,326 individual specimens to be seen at the Agricultural Hall for the modest sum of one shilling.

The arrangement of the classes for live poultry was somewhat different this time to formerly, inasmuch that the catalogue opened with Dorkings, which were staged in the North Gallery Annexe, and the numbering from thence ran uninterruptedly round the galleries to the duck room, where the breeding pens were located. This slight alteration proved of great benefit in facilitating the work generally, and it also appeared to be appreciated by the exhibitors and the public.

The general quality of the exhibits was of a very high standard, proving that the season had been a good one for hatching and rearing the chickens, many of the specimens being well developed and furnished.

The selling classes were even better filled than usual, which is saying a good deal, for these have always been well patronised by breeders who realise that the first classic show of the season is the best medium for the disposal of surplus stock. The sale by auction was very largely attended, the competition in the £2 selling classes being particularly keen, very many specimens fetching considerably over catalogue price, in one instance a Buff Orpington being knocked down for £8 5s., whilst several made from £3 to £6 each.

#### TABLE POULTRY AND RABBITS.

These, following the precedent of past years, were placed in the annexe to the Gilbey Hall, and made a very nice display, despite the fact of the entry being somewhat less than twelve months ago. Orpingtons opened the pure-bred section, of which there were 16 couples of cockerels and 12 couples of pullets, the Silver Medal going to the first-prize cockerels.

Of Sussex cockerels 15 couples were on view, the Medal being captured by a grand pair of speckled. The same number of pullets formed the next class. Only eight couples of any other variety cockerels and five couples of pullets were entered, White Wyandottes securing the first prize in each class. Cross-breds were in great force, the two classes for Indian Game and any other pure breed contained 25 couples of cockerels and 21 couples of pullets. In each instance Indian Game-Dorking won the Silver Medals. There were 15 couples of cockerels of Any Other Cross, and 14 couples of pullets. Light Sussex-Rock Cross secured the first prize in the former class; Sussex-Game in the latter. Ducks were not very numerous, but a very nice pair of Aylesburys were awarded first prize in a class of 10 entries. Eleven goslings formed a choice little lot. The two 'Special' classes were not so well filled as in previous years, there being only 17 couples of cockerels and 17 couples of pullets, but the quality was all there. The two rabbit classes were excellent, many very creditable exhibits being staged.

#### LIVE POULTRY.

As previously stated, the classification and the arrangements were slightly altered this time, inasmuch that the breeding pens, which used to head the catalogue, now came near the end, that is, just before the selling classes, so that Dorkings held the place of honour of opening the list. This fine old English breed was fairly well represented by 16 dark cockerels and 15 pullets, Silver Greys by 9 cockerels and 10 pullets. A very typical dark pullet being considered the best Dorking in the four classes, was awarded the Silver Medal. Modern Black Langshans were poor in numbers to what have been seen at the Dairy Show in years past. Thirteen cockerels and exactly the same number

of pullets were small lots, when compared with ten years ago (1903), for then 20 cockerels and 31 pullets comprised the two classes. It would appear that the excessive length of leg now required has frightened some of its former partisans, and they have transferred their fancy to the more symmetrical "Croods," for of these the cockerel class contained 21 and 24 pullets, the Medal-winning cockerel being a most excellent example of the variety. Undoubtedly the Croad Langshan is a very useful bird and has a bright future before it. Brahmas were decidedly good, and mustered 37 in the four classes, the dark cockerel which was awarded the First and Special and the Medal-winning light pullet were very typical and capital representative specimens of their respective varieties. It is somewhat remarkable that last year when Cochins had four classes allotted to them, of which one had to be cancelled, the remaining three only contained 19 entries, whilst this time, with only two classes, 24 birds were entered for competition, and a particularly nice lot they formed.

That most useful breed, the Sussex, made a grand display of 149 birds in eight classes, the "Speckled" variety being particularly strong. Of red cockerels there were 16 and a like number of pullets. The 18 light cockerels were good, the second-prize bird being claimed at the catalogue price of £5 8s. 6d., so that it proves that there is money in what is generally considered a purely utility race of poultry. Twenty-one pullets formed a capital class. Speckled cockerels made a large class of 25, but were outnumbered by three pullets of their variety. Ten brown cockerels and 15 pullets completed the Sussex section, and then came the French. Houdans were less than the previous year, but a very typical pullet secured the Silver Medal and the Special. Faverolles had a more extended classification this time, a class for buffs being instituted, which have the appearance of making a very pretty and useful variety of this esteemed breed. Salmon cockerels numbered 19, the first-prize winner taking the Silver Medal for the best Faverolle. The pullets were a very strong lot of 29, the first-prize bird being claimed at the catalogue price of £5. Thirteen white cockerels and 16 pullets, together with eight buff cockerels or pullets, made up the total of 109 Faverolles. Malines were provided with two classes for the first time at the Dairy Show, as were two for La Bresse. Of the former, 23 entries faced the judge, but of the latter there were only nine entries. Both breeds have excellent utility reputations on the other side of the Channel, and deserve more cultivation on this, for at present La Bresse are kept on a very limited scale. The useful little Campines made a grand display of 29 cockerels and 29 pullets, the first-prize cockerel, a charming silver, secured the Special and Medal. In both classes the first-prize winners were shown by ladies.

After a lapse of years Polands were treated to two classes again, but unfortunately only five cockerels were entered, but all were of capital quality, the first-prize bird being a very good silver. Of the 10 pullets a white-crested black of typical proportions led the way.

Wyandottes formed a really grand section, there being no less than 324 in the 17 classes, not a record for the Dairy Show, but a good average



entry. As might be expected, the whites and the blacks were the strongest, though 29 silver-laced pullets formed an excellent collection for this variety. Partridges would not seem to be in such favour as they used to be, for 11 cockerels and seven pullets were very few to what we have seen in the Agricultural Hall. Fifty-one white cockerels and 49 pullets gave the judge plenty to do to select the winners. The black cockerels were not very numerous, but the class of 34 pullets brought the total up to the average. Columbians were good, and so were the Spangleds. The two remaining classes contained mostly buffs, with a sprinkling of blue-laced, silver-pencilled, and a white-laced black.

Orpingtons were 52 more than in 1912, so that the grand total was 393, as against 341, a fact which argues well for the continued popularity of this very useful breed. Black cockerels opened the section with 37 entries, all of which were of excellent merit, the first-prize winner being a very typical specimen. Forty-one pullets made a capital class. The white were particularly strong, there being no less than 55 cockerels and 63 pullets, all of very uniform quality and merit. The two classes for buffs contained no less than 105 entries, there being one more male than female. Amongst the cockerels was found the best bird in the Show, a truly splendid example of a Buff Orpington, a bird without a fault. What struck one most was the evenness of colour and uniformity of type of the pullets. Jubilee and Spangles were about up to the average, but the Blues have wonderfully improved in colour as well as in quantity, for, whereas in the previous year there were only 13 cockerels and 17 pullets, or 30 birds in the two classes, we had this time 23 cockerels and 33 pullets, a total of 52 entries, which fact indicates that the variety has evidently "taken on," a decided contrast to the Cuckoos, which seem to still remain in the hands of one exhibitor, there being only six entries in the two classes.

British Rhode Island Reds are a variety that is going ahead by leaps and bounds, and it will not be surprising if it ranks amongst the most favoured fowls of our domestic poultry. At the last Show the four classes contained no less than 153 exhibits, as against 95 last year. The single-comb variety were the strongest classes, but the Medal was awarded to a very fine rose-combed cockerel, which unfortunately injured his upper mandible on the first day of the Show and had to be sent home, thus depriving the public of seeing a splendid example of the breed. Anconas and Hamburgs were just about as usual. Old English Game made a very good display, the Silver Medal winning brown-red cockerel being very typical and hard feathered. Minorcas well maintained their reputation for numbers and excellence of quality, and here again the newer sub-variety of rose-combs made a nice addition to the collection. Andalusians are certainly on the upward grade, the two classes being better filled than in the past few Shows, whilst the quality of the lucing was decidedly good. Leghorns, as usual, were well to the fore, and though none of the classes were particularly large, all (with the exception of that for buff cockerels) were comfortably filled and truly representative of the different colours. The first-prize white cockerel well deserved the Association's Silver Medal awarded

him, as he was a well-grown and capitably-furnished example of the breed. Plymouth Rocks were quite up to the usual form at the Dairy Show, the barred variety making two very strong classes, the first-prize cockerel gaining the Silver Medal. The total number of Rocks entered being 153, as against 97 in 1912. Silkies, Indian Game, and Malays were on a par with previous shows, whilst Yokohamas were decidedly better, there being nine cockerels and seven pullets. The Any Other distinct variety classes contained a nice assortment of the "classless tribe," including Scotch Greys, Black Spanish, Creve Cœurs, Azeels, Blue Croad Langshans, Sicilian Buttercups, and a Bosnian; in both classes good Creves winning. Breeding pens were again more numerous than in any previous year—the feathered-legged breeds being represented by 10 entries, Buff Cochins gaining first, Light Brahmas second, and White Cochins third. In the class for Plymouth Rocks, Wyandottes, or Orpingtons, 27 pens competed for the three prizes, White Wyandottes leading, being followed home by Black Orpingtons and White Orpingtons. In the Any Other Variety clean-legged class, first prize was awarded to a capital pen of Old English Game, the second going to Black Hamburgs of fine merit, and Indian Games being third. This time all the breeding pens were located in the Arcade Gallery over the geese and turkey pens, and a very fine sight they made in the splendid top light always obtained there. The selling classes contained a grand lot of capital birds, and, judging by the keen competition at the auction, many fanciers had "spotted" the excellence of very many of the exhibits, and I never remember hearing or seeing so many birds knocked down in the Agricultural Hall.

#### WATERFOWL.

The Duck section was the only one that did not show any very material increase in the number of entries, and the classes for Cayugas, drakes and ducks, had to be cancelled for want of support. Indian Runners and Orpingtons made, perhaps, the best-filled classes, but being closely pressed by the Aylesburys; Pekins and Rouens not being strong. Geese were good, especially the Toulouse, the Medal-winning (over one year) gander being a particularly typical specimen.

#### TURKEYS

were practically about as last year in numbers, there being 78, as against 76 in 1912. The white classes being much better filled, and neither class had to be cancelled, but the remaining four classes were certainly not so strong.

#### BANTAMS.

The quarters for these little favourites were transferred from those they had occupied for several years past in the North Gallery Annexe, and which had become to be known as the "Bantam Room," to the Berners Hall, but, in consequence of the increased entry, they overflowed into the Arcade Gallery. However, the change of lodgings did

not upset them in the least, and when some of the older fanciers get used to the new situation it may be expected that they will appreciate the altered location. The rearrangements enabled breeding pens for Game Bantams and also breeding pens for Bantams not Game to be included in the schedule, and these classes to be placed at the head of their respective sections. Ten breeding pens of Game Bantams made a very pretty display. Modern Game were good, as were also the Old English Game, all the classes being nicely filled with typical little birds. Malay Bantams made only moderate classes, as did also the Yokohamas. Then came the "Not Game" Bantams headed by the classes for breeding pens, which consisted of seven, a well-matched lot of Gold Sebrights being first, Indian Game (a pullet-breeding pen) being second, and Silver Sebrights third. Black Rosecomb cocks were certainly good. Sebrights, were excellent, and amongst the Golds was found the Champion Bantam in the Show, a charming little hen with beautiful lacing; she also took the Association Silver Medal. The Booted or Belgian breeds formed a remarkably pretty and good class of 16 entries, a very typical little white Booted cock getting first, a white-whiskered Booted cock second, and a Millefleur hen third. In the Any Other Variety class was to be seen a rumpy gold Sebright cock, and a worthy mate for him was exhibited in the hen class.

Taking the Bantam section as a whole, it was excellent and well worthy of inspection, being rather above the average seen at the Dairy Show.

## THE PIGEON SECTION.

By JNO. H. ROSS.

THE continued popularity of the Society's Annual Show at Islington, both among exhibitors and the general public, was never more manifest than in 1913, for which the pigeon section proudly claims its full share in bringing about. The event having been held a fortnight later than last year, thus enabling the birds to get well through with their moult, greatly assisted their general appearance. The average of quality was well maintained and fairly level, while, as is to be expected at the premier show, there were a few choice birds of quite outstanding merit. The exhibits numbered 2,465, representing a slight fall of 25 on the previous year, which itself exceeded the three preceding years by well over 200.

It is very gratifying to the Fancy to know that Mr. S. Palgrave Page, our President, is himself an ardent pigeon fancier, with many trophies to his credit. No one could possibly take more interest in the section than he has done.

The different varieties, with their respective awards, are noticed below in detail :

*Fantails*, as usual, led the classification, and were a grand collection in every way, numbering 106 pens in seven classes against 88 pens in six classes last year. The quality was most satisfactory all through, the winning young White hen being a model (Pen No. 3884, G. E. Gray) having both First and the Fulton Trophy to her credit. The Blue (Pen 3900, W. Stevenson) and the Black (Pen 3915, G. E. Gray) were both good and much above the average. The Reds and Yellows, although good, do not show much improvement, but, taken as a whole, the quality was in advance of last season.

*Pouters* had two classes and numbered 18 pens. I cannot say that I was impressed with the birds altogether, although some were really good. This variety appears to be going back and were not up to the standard I have seen at the Dairy.

*Pugny Pouters*. - This charming variety was quite a feature of the Show and attracted much attention from visitors by their friendly behaviour when talked to. They numbered 124 pens in 13 classes. The silver medal of the Association was awarded to Pen 4080 (H. N. Leighton) with a grand little bird. The quality indeed was very gratifying all through, and the variety appears to be gaining ground.

*Norwich Croppers* were in four classes with 42 birds, compared with 40 in three classes last year. The judge described the quality as "grand," which indeed was the case, there being many winners at previous shows amongst them. The colours of these birds have been much improved of late.

*Carriers* were disappointing in numbers, but the quality was certainly very good. Eight classes were allowed to stand, numbering 57 pens only. The Silver Medal for the 1913 bird was won by Pen No. 4174 (F. Mayer).

*Barbs* had two classes provided this year and numbered 23 pens, which is a slight improvement on last season, when three classes had but 24 birds (adults). The quality was exceptionally high and the class for 1913 held young ones of great promise, although scarcely up to the standard of former years. At one time this was one of the best sections, and I am sorry to see this old variety so poorly supported.

*Dragoons* mustered strongly and were a splendid exhibit, numbering 365 pens, or 14 less than last year, but seldom, I think, has a finer collection been seen at the Agricultural Hall. The adult Blues possibly may not have reached the standard of excellence attained by breeders of this colour in former years. The Grizzles seem to have acquired a great fixity of type and the colour seldom equalled. The Chequers for type and quality stand well to-day. Silvers were also very good, though some showed a tendency to the old failing—bronzy breasts. Yellows and Reds provided examples showing good characteristics, but I cannot say that I think they have gone much ahead, the colours having failed to show any improvement on last year's exhibits. The Whites contained many specimens of decided merit. Blue cocks (1913) were only moderate, while Blue hens were good on the whole, though many lacked the "ruby eye." The Cotton Challenge Cup fell to Pen 4490 (C. W. Patterson), who was also awarded a Gold Medal. Grizzle cocks and hens were good in skull, eye and cere. Chequer cocks and hens were a grand lot, excelling in richness of eye and quality of cere. Silver cocks and hens were a very fair exhibit. Yellow and Red cocks and hens were very nice classes, but I have seen much better colour, I think, in both cases, years gone by. Whites (cocks and hens) were good for this colour, but seemed long in feather.

*Short-faced Tumblers* were a most charming lot, the majority being in splendid fettle. They numbered 85 pens in eight classes, slightly fewer than last year. The Silver Medal of the Association was won by Pen 4581 (H. Tarry) with an Almond. It is very pleasing to note the interest taken in this old variety.

*Long-faced Tumblers.* This section made a very good display, and exhibitors seemed well satisfied with the awards of the two judges. The 19 classes contained 223 pens, the First and Silver Medal of the Association going to Pen 4852 (A. Crawford). The present classification seems to be acceptable to exhibitors of this variety. One of the judges remarked that he had never seen better long-faced tumblers staged at the Dairy Show. In the young classes the quality was also exceptionally promising.

*London Beards* could not muster more than one class. This very old variety does not seem to take on with breeders. The 12 exhibited, however, were of the best, and I am somewhat surprised that the breed is not better fancied.

*Owls.* Classes for English owls were cancelled. The foreign owls had seven classes fairly supported by 59 pens, the quality being good right through, and the condition of the birds grand.

*Turbits* numbered 66 pens in seven classes. I am surprised at the small number exhibited, the season having been so favourable for moulting. The quality, however, was all that could be desired, the manner in which they were handled by the judge being well commented upon. The Medal of the Association went to Pen 1994 (G. H. Widger), with a lovely Blue.

*Archangels* were in four classes and 64 pens, including 40 in two classes for 1913 birds. The quality all through was quite exceptional, the two Specials given by the Club being awarded to Pen 5023 (E. Newman), and Pen 5069 (P. T. Wiltshire).

*Jacobins* were provided with six classes, and numbered 47. They scarcely came up to Dairy Show form, and seem to have had a bad moulting season. Taken altogether, however, they were a creditable lot.

*Runts.* These monsters of the fancy numbered 11 in two classes, the quality in the adult class being about as usual. The 1913 birds had amongst them a good Silver and even a better White.

*Nuns* made a very nice show with 45 in three classes. The birds were in good fettle with one of the best averages in the Show, the quality being good all through. The judge remarked on the improvement in type.

*Oriental Frills* were in 11 classes and 106 pens. They formed a grand collection for type, &c., and were a great improvement on some previous shows. The 1913 classes were the best supported, the Esquilant Trophy going to a Dun Blondinette, Pen 5232 (W. Turton), probably the best seen for years. It is remarkable to note in passing that the same bird won the Jones Trophy at the Crystal Palace also, the first time on which the double event has occurred. Many other grand specimens of this variety were also on view.

*Modenas*, with 69 pens in six classes, provided a grand collection of this most charming variety. These lovely birds vie in colours with the Oriental Frills and the Short-faced Almond Tumbler in their various markings. They were greatly attractive and much noticed by visitors.

*Maggies* were well represented with 146 birds in 14 classes. They came well up to the usual standard, the quality being exceptionally good and competition keen. The Silver Medal of the Association fell to Pen 5421 (W. R. McCreath).

*Scandaroons.* These peculiar looking birds came up well with 37 pens in three classes, and usually attract attention.

*Swallows, Fairy Swallows and German Toys.* These birds made up in interest what they lacked in numbers. Swallows and Fairy Swallows had seven entries only, but the quality all through was excellent. The German Toys were also good, the first being a Yellow

Snip or Blaze Face, a most wonderful coloured pigeon. The second was a grand coloured and marked Swabian, and third, a good Black Monk. There were also other birds in the class that were noticed as capable of being in the money.

*Antwerps* had four classes in 35 pens. The quality of the adult birds was very good, superior to those of 1913. I am sorry to see this old variety apparently lapsing.

*Cumulets* mustered 32 in four classes with quality good all through.

*Tipplers* made a very fair exhibit with 39 entries in four classes. All seemed in good condition.

*Working Homers*, numbering 144, in six classes, are always a good and interesting exhibit at the Dairy Show.

1. Cock or hen adult flown at least 200 miles, numbered 29.

2. Cock or hen adult flown at least 100 miles, numbered 16.

3. Cock or hen (bred 1913) flown at least 75 miles, numbered 75.

4. Cock or hen (not trained), 24.

I think the performances most wonderful.

*Exhibition Flying Homers* were in 69 pens and six classes. The entry was rather disappointing, and is accounted for by several prominent names not appearing in the catalogue. Many of the birds were a decided improvement on last year, and as this is a comparatively new variety, the result is very creditable to the breeders. The First and Silver Medal of the Association went to Pen 5861 (Wellband and Dearnly).

*Show Homers* were represented by 12 classes and 202 pens. They were a grand lot of birds, the all-round quality being excellent, with most of the best specimens on view. They had, indeed, the best average over all the pigeons in the Show. The Silver Medal of the Association was won by Pen 6067 (H. Whitley) with a grand Blue.

*Any Other Variety* formed a nice collection of seven pens, the judge suggesting that Trumpeters should have a separate class.

*Selling Classes* were well filled and contained some most useful birds of different varieties, in 83 pens, many of which changed hands at the auction and private sales to the advantage of the Society, the sum realised being well in advance of last year.

In concluding my report, I should like to add that the arrangements of this section (carried out as they were on similar lines to previous Shows) worked out on the present occasion better and smoother than I have ever known in my 30 years' experience of the stewardship of this department.

## APPLICATIONS FOR PATENTS FOR DAIRY APPLIANCES, &amp;c.

From January 1st to December 31st, 1913.

No. of Application.	Name of Applicant.	Subject of Invention.
323	Hudson, E. V. . . . .	Machines for cleaning milk.
375	Blake, J. H. . . . .	Cheese.
493	Hedges, C. . . . .	Milking appliances.
3,364	Kennedy, R. . . . .	Milking machines.
3,534	Lassen, N. . . . .	Treating butter to facilitate blending and washing.
3,830	Frost, A. E., and Dairy Outfit Co. . . . .	Railway milk cans.
4,088	Schupp, O. . . . .	Milk testers.
4,834	Heyman, K. W. . . . .	Milk distributing
6,180	Moreton, C. J. . . . .	Milking apparatus.
6,288	Boyce, W. L. . . . .	Structures for facilitating the milking of cows.
6,649	Frost, A. E., and Dairy Outfit Co. . . . .	Com - freed liquid delivery apparatus.
6,722	Wallace, R. . . . .	Teat-cups of cow milkers.
6,762	Tarr, A. H. . . . .	Straining and cooling new milk.
6,826	Walleker, G. S. . . . .	Supplying food and liquid to cows.
7,673	James, J. D. . . . .	Cutting cheese.
8,073	Arenskov, L. P. . . . .	Cutting cheese.
8,771	Ellis, J. . . . .	Manufacture of lactide.
9,390	Guigell, W. . . . .	Testing samples of milk.
9,894	Sloun, J. . . . .	Teat-cups for milking machines.
10,652	Hornle, E. . . . .	Teat-cups for milking machines.
11,002	Kurwood, J. C. . . . .	Milk cans.
11,144	Atkinson, J. . . . .	Milk can carrier.
11,411	Lübke, W. . . . .	Milking devices.
11,518	Cornish, J. H. . . . .	Vacuum - operated milking machines.
11,726	Jenkins, H. R. . . . .	Milking machine teat-cups.
11,733	Woollard, B., and anr. . . . .	Separators.
11,927	Robertson, A. R. . . . .	Centrifugal separators.
12,888	Alberty, A. M., and anr. . . . .	Milk modifier.
13,047	Gourlie, J. H. . . . .	Cream beater.
13,328	Cheeld, S. . . . .	Churning butter.
13,888	Dairy Outfit Co. . . . .	Milk can, &c., casings.
14,089	Fisher, F. W. R. . . . .	Milk can lid.
14,096	Mazzacani, A. . . . .	Centrifugal separator.
14,196	Altendorf, A. . . . .	Milk churns.
14,249	Lobeck, O. . . . .	Sterilising milk.
14,256	Lobeck, O. . . . .	Sterilising milk.
14,411	Lübke, W. . . . .	Milking device.
14,413	Cordonner, E. . . . .	Weaning kids, &c.
14,416	Sibley, W. P. . . . .	Churns.
14,616	Reymorse, A. . . . .	Sterilising milk.
14,815	Reeve, V. . . . .	Securing milk cans.
14,901	Watford, C. . . . .	Milk tin lid.
14,961	Storrie, A. . . . .	Milk releasers.
15,213	Kennedy, R. . . . .	Milking machines.



## APPLICATIONS FOR PATENTS FOR DAIRY APPLIANCES, &amp;c.

*From January 1st to December 31st, 1913—(continued).*

No. of Application.	Name of Applicant.	Subject of Invention.
15,221	Higgins, E. B. ... ..	Purification of butter.
15,228	Hudson, C. W. ... ..	Milk pail covers.
15,532	Kennedy, R. ... ..	Milking machines.
15,753	Shaw, A. R. ... ..	Churns.
15,946	Tödt, H. ... ..	Cream separators.
16,174	Geninazzi, F. C. ... ..	Locking milk cans to doors.
16,368	Abbott, Field, & Co. ... ..	Churn &c. closures.
16,432	Schubert, C. ... ..	Milk receptacles.
16,630	Zmeskall, G. ... ..	Manufacture of butter.
16,714	Rogers, W. A. ... ..	Milk churns and cover.
17,077	Roberg, W. A. ... ..	Preserving desiccated milk.
17,573	Melhuish, A. E. ... ..	Soya milk.
18,055	Williams, — ... ..	Churns.
18,871	Dorman, W. H. ... ..	Collecting cream from milk.
19,420	Kühn, E. W. ... ..	Condensing milk.
20,240	Macdonald, J. B. ... ..	Churns.
20,248	Crabb, D. H. ... ..	Churns.
20,263	Penfold, W., and anr. ... ..	Buttermaking machine.
21,052	Winter, J. A. ... ..	Milk churns.
21,172	Ewing, M. ... ..	Ventilating butter churns.
21,295	Davies, J. H. ... ..	Desiccated milk.
22,026	Bareche, C. ... ..	Milking machines.
22,232	Lewin, W. and anr. ... ..	Machine for producing butter pats.
22,613	Wielaret, J. ... ..	Milking machines.
23,230	Cameron, E. ... ..	Milking machines.
23,463	Wolvin, J. ... ..	Cutting-boards for cheese.
24,169	Gould, W. ... ..	Butter and cheese taster.
27,015	Dunham, A. A. ... ..	Process for producing desiccated milk.
29,138	Aktiebolaget, O. and I. ... ..	Milking machines.
29,332	Jagenburg, E. ... ..	Apparatus for separating individual pieces of butter from a "string."

## ANNUAL REPORT OF THE CONSULTING CHEMIST.

By F. J. LLOYD, F.C.S., F.I.C.

DURING the past year there has been a slight increase in the number of samples submitted to me for analysis; but considering the number of members and of affiliated societies one cannot but feel that the value of the analyst to the dairy farmer is not yet properly appreciated.

The prosperity of all farming depends primarily upon making the best use of the materials dealt with. You cannot get the maximum crop off land unless the soil contains the constituents essential to that crop. You cannot give a crop the constituents it requires unless you are quite sure that the manure applied contains those constituents, and contains them in a form available to the plant. The same is true of live stock. Whether the object be to fatten stock for the market or to feed for milk production, it can only be accomplished profitably by a thorough knowledge of the composition of the artificial foods supplied.

In view of these considerations it is remarkable that during the past year I received only one sample of soil, three samples of manures, and one sample of artificial food.

*Milk.*—The majority of the samples sent were milk, many of them sour and only sent after the public analyst had reported unfavourably. It is a great mistake for milk producers when the milk is sampled to wait for the public analyst's report on the sample. The duplicate sample sent to the producer he should have analysed at once. Then, if the milk is not satisfactory, he can without delay try to discover the cause and remedy the fault. I have known a farmer's supply to be analysed by the local authority and found wrong, a fortnight later another sample was taken and this also found wrong; Of course, a prosecution was instituted, and then the farmer sent the two sour samples for analysis. Had the first sample been sent for analysis the moment it was received, the farmer would have had 11 days in which to try to improve the quality. The second sample might then have proved satisfactory and the farmer been in a position to explain the cause of the first sample being below par. As a fact, such a case actually happened during the past year. No one was more surprised than the farmer himself to find the milk so poor. Steps were taken to remedy the defect, and the local authority were satisfied that it was not a case for prosecution. Many of these cases are due to the false theory which is promulgated at the present day that the food of a cow does not affect the quality of her milk. This may be true of a cow in good condition obtaining ample food of the right quality. It is not true of the majority of cows in the country out on the pastures. Many circumstances will then affect the milk, especially the morning's milk, and it is such milk which so frequently brings the dairy farmer into trouble.

*Creams.*—A large number of samples, 34 in all, were received during the year. Many of these were sent for the estimation of preservatives, owing to the new Regulations of the Local Government Board.

*Waters.*—Six samples were sent me, five of which were satisfactory, but one was highly contaminated with sewage and quite unfit for drinking, domestic, or dairy use.

*Rubbish.*—It is quite remarkable how cheap (?) substances attract the farmer. During the year I have received two samples of rubbish which had been bought. The first contained 3·61 per cent. of phosphate of lime and 2·10 per cent. ammonia, but it was such a dry, fine, dirty powder that one was smothered with it upon the least handling. The second had a strong smell of ammonia, which attracted the buyer, but upon analysis was found to contain only 0·34 ammonia and 2·85 of phosphate of lime. This sample contained over 20 per cent. of water and 40 per cent. of sand. It would not pay a farmer to cart and spread such rubbish even if he obtained it for nothing.

*Feeding Stuffs.*—I would draw attention to the fact that decorticated cotton-seed meal is now being adulterated with finely ground cotton-seed husk. I have found as much as 10 per cent. of this adulterant in one sample, and yet this was not visible when looking at the meal, being hidden by the fine, bright yellow powder of the meal.

Such are the main points of interest arising out of my work during the year. In all, 488 samples were analysed, 188 being from members and 300 in connection with the Dairy Show.

# British Dairy Farmers' Association.

## EXAMINATION FOR THE B. D. F. A. DIPLOMA.

The Association grants to any Candidate who satisfactorily passes the necessary Examinations:—

### **A Diploma and Silver Medal for Proficiency in the Science and Practice of Dairying and Dairy Farming.**

Candidates for the Diploma must have previously obtained the Butter and Cheese-making Certificates of the Association,\* and must produce satisfactory evidence that they have received not less than one year's scientific and practical instruction at some recognised centre for Dairying Instruction, and have spent at least twelve months on a farm in addition to the time spent at the Centre.

The Examination will extend over three or more days, and will test (1) the knowledge and experience of the Principles and Practice of Dairying and Dairy Farming, and (2) the skill in making Butter and Cheese, of each Candidate.

Candidates will be required to answer, in writing, sets of questions within a given time, and will also be examined *visu voce*. They will be expected to possess a detailed and precise knowledge of all the subjects included in the following Syllabus. They will have to make both Butter and Cheese. Candidates, if required, must produce their note-books of Lectures and Demonstrations attended.

Examinations for Diploma are held in the Autumn upon dates announced in the Agricultural and Dairy Press.

Entries will close 28 days prior to the date fixed for the Examination.

The Entry Fee is 10s.

### SYLLABUS.

#### 1. DAIRYING.

- (a) Milk.—The Yield of Milk from various Breeds; Milking; Handling of Milk from Cow to Dairy; Importance of Cleanliness; Cooling of Milk; Sale of Milk; Influence of Food on the Yield, Flavour, and Fat Contents of Milk; Composition of Milk, Nature and Properties of its Constituents; Differences between Morning and Evening Milk and their Causes; Methods of Sampling and Simple Methods of Testing Milk, as the Lactometer, Creamometer and Centrifugal Fat Testers; Testing for Acidity; Causes of Fermentation; Colostrum, its Nature and Properties; the Keeping of Dairy Records; the Handling of Evening's Milk for Cheese-making; Properties of Milk suitable for Cheese-making; Taints in Milk—their Causes, Effects and Remedies; Tests for such Taints; the Ripening of Milk for Cheese-making; Methods and Reasons for Ripening; use of Natural and "Culture" Starters; Pasteurization of Milk; Chilled Milk: their Subsequent Use for Cheese-making; Special Testing of Milk, Whey, and Curd requisite in a Cheese Dairy.
- (b) Cream.—The Various Methods of obtaining Cream; the Construction and Use of the Utensils Employed; Separators, the Construction and Use of the various Types; Composition of Cream, Separated Milk, Skimmed Milk and Butter-milk, with Simple Tests for Fat in same; the Ripening of Cream, Objects and Results; Changes during Ripening; Testing for Acidity; Natural and Artificial Ripening and Preparation of Starters; the Preparation of Cream for Churning; Preparation of Cream for Sale; Clotted Cream.

\*Equivalent Certificates of recognised bodies will be accepted by the Association as evidence of sufficient training to justify entry for this Examination.

- (c) **Butter.**—The Various Methods of obtaining Butter, including the Churning of Whole Milk; Utensils required and the Preparation, Use and Care of same; the Process of Butter Manufacture in all its Details; Conditions which affect the Butter Yield; Circumstances affecting the Flavour, Texture, Colour and Keeping Properties of Butter; Dry-salting and Curing of Butter; Faults in Butter and their Causes; Composition and Properties of Good Butter; Composition and Causes of Inferior Butter; Methods of Judging Butter.
- (d) **Cheese.**—Rennet: its Preparation, Properties, and Action upon Milk; Testing its Strength; Storage of Rennet; Substitutes for Rennet; Annatto; the Colouring; Discoloration of Cheese; a General Knowledge of the Manufacture of the Principal Varieties of Hard-pressed, Blue-veined, and Soft Cheeses including the use of Wood and Metal Tubs and Jacketed Vats; Methods of Scalding; the Development and Control of Acidity in Curd; Salting and Brining in Cheese-making; Bandaging; Ripening and Storing of Hard-pressed, Blue-veined and Soft Cheeses; Defects in Cheese and their Causes; Composition of Cheese; Composition and Utilization of Whey; the Manufacture of Whey Butter; the Equipment of a Cheese Dairy and its Cost; the Care of Utensils.

The detailed Principles and Practice requisite for the Manufacture of one of the following types of Cheese— to be selected and made by the Candidate:—

- (a) A Hard-pressed British Cheese (not less than 25 lbs. weight).  
 (b) A Blue-veined British Cheese (not less than 10 lbs. weight).

## 2. DAIRY FARMING.

(a) The General Principles and Practice of Dairy Farming; the Management and Equipment of a Dairy Farm.

(b) **Agricultural Botany.**—Appearance and Identification of the Common Varieties of Grasses and other Pasture Plants and Weeds. Their Effects upon Milk and Dairy Produce.

(c) **Crops.**—A General Knowledge of the Cultivation, Manuring, and Harvesting of Farm Crops with a Special Knowledge of those Crops employed in the Feeding of Dairy Stock; the Management of Pasture and Meadow Land; Haymaking and Ensilage: the Factors which bear on their value as Fodder for Stock.

(d) **Foods and Feeding.**—The Effect of various Foods on Milk and its Products; Systems of Feeding and the Compilation of Rations.

(e) **Live Stock.**—Characteristics and Management of Different Breeds of Cattle; their Breeding and Rearing; Choice of Dairy Cattle for Special Purposes and Situations; Pigs and Poultry; Suitable Breeds for Use in Connection with a Dairy Farm and their Management; Horses.

(f) **Diseases of Dairy Stock,** such as: Tuberculosis, Anthrax, Foot and Mouth Disease, Contagious and Sporadic Abortion, Chronic and Acute Indigestion, Mastitis, Milk Fever, Sore Teats, Husk, Diarrhoea, White Scour in Calves, Common Causes of Poisoning.

(g) **Physiology of Digestion and Milk Secretion.**

(h) **Buildings** suitable for a Dairy Farm: their Situation, Construction, Ventilation, Drainage, &c.; Water Supply.

(i) **Book-keeping** on a Dairy Farm; Milk Records; Business Methods involved in Dairying and Dairy Farming.

(k) **Farm Implements and Machines;** their construction and use.

3. AGRICULTURAL CHEMISTRY.

(a) General.—The Chemical Elements and Constituents found in Milk, Soils, Plants, Manures, Animals and Foods; their Nature and Properties so far as they relate to Agriculture; the simpler Laws of Chemical Combination and Change so far as regards these Substances.

(b) Dairy. —The Composition and Properties of Milk, Cream, Butter, Cheese, and Dairy Products, and of all Substances used in the Dairy; Simple Methods of Analysis as applied to these Substances; the Chemical Changes which may take place in Milk, Cream, Butter, &c.

(c) Agricultural.—The Composition and the Chief Chemical and Physical Properties of Soils, and their Constituents; the Chemical Means of Ameliorating the Soil; the Source, Composition, and Use of the usual Natural and Artificial Manures; the Chemistry of Plant Growth; the Composition of Crops; the Source, Composition, and Use of Artificial Feeding Stuffs; Drinking Waters; the Chemistry of Animal Nutrition.

4. AGRICULTURAL BACTERIOLOGY.

(a) General.—Bacteria, their Form, Classification, Growth and Reproduction; The Microscope and its Use; Staining and Microscopic Examination of Bacteria; Methods of Isolation and Cultivation; Preparation of Culture Media; Fermentations and Chemical Changes produced by Bacteria; Enzymes and their Action; Effects of Heat, Cold, Sterilization, Pasteurization, Disinfectants, and Preservatives on Bacteria and Enzymes.

(b) Dairy Bacteriology.—The Bacteria of Milk and Dairy Products; Examination of Milk for Foreign Bodies, Sediment, Blood, Pus, and Pathogenic Organisms; the Bacteriology of Milk, Cream, Butter, and Cheese; Commercial Bacterial Preparations for use in the Dairy, Bacteria Injurious to Dairy Produce; their Source, Nature, and Treatment.

(c) Agricultural Bacteriology.—The Bacteria of the Soil; Bacteriological Examination of Soils, Air, Water, &c.; Action of Heat and Antiseptics on Soil Bacteria; Nitrification; Bacteriology of Farmyard and other Manures; Plant Bacteria and Assimilation of Nitrogen.

(d) Fungi (Moulds) and Yeasts.—Their Forms, Classification, and Growth; their Relation to Dairy Produce, to Soils and Plants, and to Feeding Stuffs.

## EXAMINATION FOR DAIRY TEACHER'S CERTIFICATE.

The Association grants to any Candidate who satisfactorily passes the necessary Examinations : —

### A Teacher's Certificate for Proficiency in the Science and Practice of Dairying.

Candidates for this Certificate must have previously obtained the Butter and Cheese-making Certificates of the Association,\* and must produce satisfactory evidence that they have received not less than twelve months' instruction at a recognised centre for dairy instruction.

The Examination will extend over three or more days, and will test (1) The Theoretical Knowledge of the Candidates; (2) their skill in making Butter and Cheese; and (3) their ability to teach and elucidate the Elementary Principles and Practice of Dairying.

Candidates will be required to answer, in writing, sets of questions within a given time, and will also be examined *viva voce*. They will be expected to possess a detailed and precise knowledge of the subjects included in the following Syllabus, together with a fair knowledge of the General Management and Feeding of Dairy Cattle. They must produce a Certificate of their ability to milk. Candidates, if required, must produce their note-books of Lectures and Demonstrations attended.

Examinations for Teacher's Certificates are held in the Autumn, upon dates announced in the Agricultural and Dairy Press.

Entries will close 28 days prior to the date fixed for the Examination.

The Entry Fee is 10s

### SYLLABUS.

1. Milk. —The Yield of Milk from various breeds; Milking; Handling of Milk from cow to dairy; Importance of Cleanliness; Cooling of milk; Sale of Milk; Influence of Foods on the Yield, Flavour, and Fat Contents of Milk; Composition of Milk, Nature and Properties of its Constituents; Differences between Morning and Evening Milk and their causes; Methods of Sampling, and Simple Methods of Testing Milk, as the Lactometer, Creamometer, and Centrifugal Fat Testers; Testing for Acidity; Causes of Fermentation; Colostrum, its Nature and Properties; the Keeping of Dairy Records; the Handling of Evening's Milk for Cheese-making; Properties of Milk suitable for Cheese-making; Taints in Milk, their Causes, Effects and Remedies; Tests for such Taints; the Ripening of Milk for Cheese-making; Methods and Reasons for Ripening; Use of Natural and "Culture" Starters; Pasteurization of Milk; Chilled Milk; their subsequent Use for Cheese-making; Special Testing of Milk, Whey, and Curd requisite in a Cheese Dairy.
2. Cream. —The Various Methods of Obtaining Cream; the Construction and Use of the Utensils employed; Separators, the Construction and Use of the various Types; Composition of Cream, Separated Milk, Skimmed Milk, and Butter-milk, with Simple Tests for Fat in same; the Ripening of Cream: Objects and Results; Changes during Ripening, Testing for Acidity; Natural and Artificial Ripening and Preparation of Starters; the Preparation of Cream for Churning; Preparation of Cream for Sale; Clotted Cream.
3. Butter. —The Various Methods of obtaining Butter, including the Churning of Whole Milk; Utensils required and the Preparation, Use and Care of

\*Equivalent Certificates of recognised bodies will be accepted by the Association as evidence of sufficient training to justify entry for this Examination.

same; the Process of Butter Manufacture in all its details; Conditions which affect the Butter Yield; Circumstances affecting the Flavour, Texture, Colour and Keeping Properties of Butter; Dry-salting and Curing of Butter; Faults in Butter and their causes; Composition and Properties of Good Butter; Composition and Causes of Inferior Butter; Methods of Judging Butter.

4. Cheese.—Rennet: its Preparation, Properties, and Action upon Milk: Testing its Strength; Storage of and Substitutes for Rennet; Annatto; the Colouring of Cheese: Discoloration; a General Knowledge of the Manufacture of the Principal Varieties of Hard-pressed, Blue-veined, and Soft Cheeses, including the use of Wood and Metal Tubs and Jacketed Vats; Methods of Scalding; the Development and Control of Acidity in Curd; Salting and Brining in Cheese-making; Bandaging; Ripening and Storing of Hard-pressed, Blue-veined, and Soft Cheeses; Defects in Cheese and their Causes; Composition of Cheese; Composition and Utilization of Whey; the Manufacture of Whey Butter; the Equipment of a Cheese Dairy, and its Cost; the Care of Utensils: the Detailed Principles and Practice requisite for the Manufacture of one of the following types of Cheese, as also of a Soft Cheese to be selected and made by the Candidate:—

(a) Hard-pressed British Cheese (not less than 25 lbs. weight).

(b) Blue-veined British Cheese (not less than 10 lbs. weight).

5. Dairy Farming.—Its General Principles, Practice, and Management.

6. Food and Feeding Stuffs.—Suitable and Unsuitable Foods; Suitable Rations; Preparation of Food for Dairy Stock.

7. General Book-keeping of a Dairy.

8. The Method of Organising an Itinerant Dairy Class.

9. DAIRY CHEMISTRY.—The Chemical Elements and Constituents found in Milk, Animals and Foods; their Nature and Properties so far as they relate to Dairying; the Composition, and the Properties of the Constituents of Milk, Cream, Butter, Cheese, and Dairy Products, and of all Substances used in the Dairy; Simple Methods of Analysis as applied to these Substances; the Chemical Changes which may take place in Milk, Cream, Butter, &c.

10. DAIRY BACTERIOLOGY.

(a) Bacteria, their Form, Classification, Growth and Reproduction; The Microscope and its Use; Staining and Microscopic Examination of Bacteria; Methods of Isolation and Cultivation; Preparation of Culture Media; Fermentations and Chemical Changes produced by Bacteria; Enzymes and their Action; Effects of Heat, Cold, Sterilization, Pasteurization, Disinfectants, and Preservatives on Bacteria and Enzymes.

(b) The Bacteria of Milk and Dairy Products; Examination of Milk for Foreign Bodies, Sediment, Blood, Pus, &c.; the Bacteriology of Milk, Cream, Butter and Cheese; Commercial Bacterial Preparations for Dairy use; Bacteria Injurious to Dairy Produce—their Source, Nature, and Treatment.

(c) Fungi (Moulds) and Yeasts.—Their Forms, Classification, and Growth; their Relation to Dairy Produce.



## EXAMINATION FOR CHEESE-MAKING CERTIFICATE.

The Association grants to any Candidate who satisfactorily passes the necessary Examination—

### A Certificate of Merit for Proficiency in the Theory and Practice of Cheese-making.

The Examination, which will extend over two or more days, will test the Theoretical Knowledge of the Candidates and their Practical Skill in Cheese-making. Each Competitor will be required to answer, in writing, a set of questions within a given time, and will also be examined *viva voce*. On the same or following day a Practical Examination in Cheese-making will take place.

Candidates for this Certificate must, at the time of entry, produce satisfactory evidence that they have received at least twelve months' instruction in the Theory and Practice of Cheese-making, of which at least six months must have been spent at a recognised centre for dairy instruction. They must possess a fair knowledge of the subjects included in the following Syllabus.

They must have full knowledge of the production of one variety of Hard-pressed or Blue-veined British Cheese, also a general knowledge of the manufacture of other varieties of Hard-pressed Cheese, and of Soft Cheese. They will be required to make at least one Hard-pressed or Blue-veined British Cheese as detailed below.

Candidates are at liberty to bring their own utensils for the Practical Examination if they wish to do so

Examinations for Cheese-making Certificates are held twice a year, viz., in the Spring and Autumn, upon dates announced in the Agricultural and Dairy Press.

Entries will close 28 days prior to the date fixed for the Examination.

The Entry Fee is 5s.

### SYLLABUS.

1. Milk.—The Yield of Milk from various breeds; Milking; Handling of Milk from Cow to Dairy; Importance of Cleanliness; Cooling of Milk; Influence of Food on the Yield, Flavour and Fat Contents of Milk, Composition of Milk, Nature and Properties of its Constituents; Differences between Morning and Evening Milk and their Causes; Methods of Sampling and Simple Methods of Testing Milk, as the Lactometer, Creamometer, Centrifugal Fat Testers; Testing for Acidity; Causes of Fermentation; Colostrum, its nature and properties; the Keeping of Dairy Records; the Handling of Evening's Milk for Cheese-making; Properties of Milk suitable for Cheese-making; Taints in Milk, their Causes, Effects and Remedies; Tests for such Taints; the Ripening of Milk for Cheese-making; Methods and Reasons for Ripening; use of Natural and "Culture" Starters; Pasteurization of Milk; Chilled Milk; their Subsequent use for Cheese-making; Special Testing of Milk, Whey, and Curd requisite in a Cheese Dairy.

2. Cheese.—Rennet: its Preparation, Properties, and Action upon Milk; Testing its Strength; Storage of and Substitutes for Rennet; Annatto; the Colouring of Cheese; Discoloration; a General Knowledge of the Manufacture of the Principal Varieties of Hard-pressed, Blue-veined, and Soft Cheeses, including the use of wood and metal tubs and jacketed vats; Methods of Scalding; the Development and Control of Acidity in Curd; Salting and Brining in Cheese-making; Bandaging; Ripening and Storing of Hard-pressed, Blue-veined and Soft Cheeses; Defects in Cheese and their causes; Composition of Cheese; Composition and Utilization of Whey; the Manufacture of Whey Butter; the Equipment of a Cheese Dairy and its Cost; the care of Utensils; the Detailed Principles and Practice requisite for the Manufacture of one of the following types of Cheese—to be selected and made by the Candidate:—

(a) A Hard-pressed British Cheese (not less than 25 lbs. weight).

(b) A Blue-veined British Cheese (not less than 10 lbs. weight).

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Particulars and Entry Forms may be obtained from

The SECRETARY,

BRITISH DAIRY FARMERS' ASSOCIATION,

28, Russell Square, London, W.C.

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## EXAMINATION FOR BUTTER-MAKING CERTIFICATE.

The Association grants to any Candidate who satisfactorily passes the necessary Examination—

### A Certificate of Merit for Proficiency in the Theory and Practice of Butter-Making.

The Examination, which will extend over two or more days, will test the Theoretical Knowledge of the Candidates and their Practical Skill in Butter-making. Each Competitor will be required to answer, in writing, a set of questions within a given time, and will also be examined  *viva voce* . On the same or following day a Practical Examination in Butter-making will take place.

Candidates for this Certificate must, at the time of entry, produce satisfactory evidence that they have received at least three months' instruction (not necessarily at a Dairy School) in the Theory and Practice of Butter-making. They must possess a fair knowledge of the subjects included in the following Syllabus. They will be required to make Butter.

Candidates are at liberty to bring their own utensils for the Practical Examination if they wish to do so.

Examinations for Butter-making Certificates are held twice a year, viz., in the Spring and Autumn, upon dates announced in the Agricultural and Dairy Press.

Entries will close 28 days prior to the date fixed for the Examination.

The Entry Fee is 5s. -----

### SYLLABUS

1. Milk.—The Yield of Milk from various breeds; Milking; Handling of Milk from cow to dairy; Importance of Cleanliness; Cooling of Milk; Sale of Milk; Influence of Foods on the Yield, Flavour and Fat Contents of Milk; Composition of Milk, Nature and Properties of its constituents; Differences between Morning and Evening Milk and their causes; Methods of Sampling and Simple Methods of Testing Milk, as the Lactometer, Creamometer, and Centrifugal Fat Testers; Testing for Acidity; Causes of Fermentation; Colostrum, its nature and properties; the Keeping of Dairy Records.
2. Cream.—The Various Methods of Obtaining Cream; the Construction and Use of the Utensils employed; Separators, the Construction and Use of any one Type; Composition of Cream, Separated Milk, Skimmed Milk, and Butter-milk, with Simple Tests for Fat in same; the Ripening of Cream—Objects and Results; Changes during Ripening; Testing for Acidity; Natural and Artificial Ripening and Preparation of Starters; the Preparation of Cream for Churning; Preparation of Cream for Sale; Clotted Cream.
3. Butter.—The Various Methods of Obtaining Butter, including the Churning of Whole Milk; Utensils required, and the Preparation, Use, and Care of same; the Process of Butter Manufacture in all its details; Conditions which affect the Butter Yield; Circumstances affecting the Flavour, Texture, Colour, and Keeping Properties of Butter; Dry-salting and Curing of Butter; Faults in Butter and their causes; Composition and Properties of Good Butter; Composition and Causes of Inferior Butter; Methods of Judging Butter.

Particulars and Entry Forms may be obtained from

THE SECRETARY,

BRITISH DAIRY FARMERS' ASSOCIATION,  
28, Russell Square, London, W.C.

# EXAMINATIONS

## AT

# LOCAL CENTRES.

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In order to meet the convenience of Students at Dairy Schools, members of local Societies, and other persons, the Association will conduct Examinations for its Diplomas and Certificates at any place in the United Kingdom upon receiving satisfactory proof that the following conditions will be observed :—

That the School, Society, County Council, or other body requesting such an Examination to be held, undertake :—

- (1) To supply all necessary appliances and materials.
  - (2) To pay the fees and expenses of the Examiners.
  - (3) To supply the milk required free from preservatives and fit for Cheese-making.
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Copies of Question Papers set at recent examinations may be obtained at 3d. per copy.

Applicants are requested to state whether Diploma, Cheese, or Butter Questions are required.

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Further particulars and Entry Forms for Students may be obtained from  
The SECRETARY,

BRITISH DAIRY FARMERS' ASSOCIATION,

28, Russell Square, London, W.C.

EXAMINATION FOR BUTTERMAKING CERTIFICATES AT  
THE BRITISH DAIRY INSTITUTE, READING; ON  
TUESDAY, WEDNESDAY, AND THURSDAY, JUNE 10TH,  
11TH, AND 12TH, 1913.

EXAMINERS: C. W. WALKER TISDALE  
AND F. J. LLOYD, F.C.S., F.I.C.

Three hours are allowed for this paper.

Candidates will also be examined *viva voce* by each Examiner. Each question carries the same number of marks, and candidates gaining over 60 per cent. will pass.

Candidates are requested to make their answers as brief as possible, brief and accurate. Each answer should be written on a separate sheet of paper, and subsequently the sheets should be fastened together in order in the left-hand corner. The top sheet should bear the name of the candidate

QUESTIONS.

1. Would you recommend the keeping of milk records, and if so, why? Explain the methods you would adopt for recording the yield of a herd of cows.
2. It is found that after separation a certain amount of cream rises to the surface of the separated milk. Explain the causes for this, and how you would remedy them.
3. The yield of butter from a mixed herd of shorthorn cows was only 1 lb. from every  $3\frac{1}{2}$  gallons of milk. State the probable causes for such a poor yield and what remedies you would apply. What should be the normal yield in such a case?
4. Explain the construction and use of a combined churn and worker. State its advantages and disadvantages.
5. What is meant by streaky butter and what are the methods of preventing this fault?
6. Describe briefly the preparation of a starter.
7. Explain the process of cream ripening.
8. Describe the preparation of cream for sale. What are the regulations in force with regard to the use of preservatives in cream?
9. What are the chief causes which give rise to fluctuations in the composition of the milk of individual cows?
10. If you were selling milk what tests could you make to determine whether it came above the legal limits?
11. How would you test the acidity of cream, and within what limits of acidity would you expect to obtain good butter?
12. What is the composition of good butter? State for each of the constituents what an excess thereof would indicate and cause.

EXAMINATION FOR CHEESEMAKING CERTIFICATES AT  
THE BRITISH DAIRY INSTITUTE, READING; ON  
TUESDAY, WEDNESDAY, AND THURSDAY, JUNE  
10TH, 11TH, AND 12TH, 1913.

EXAMINERS: JOSEPH RIGBY and F. J. LLOYD, F.C.S., F.I.C.

Three hours are allowed for this paper.

Candidates will also be examined *visu voce* by each Examiner. Each question carries the same number of marks, and Candidates gaining over 60 per cent. will pass.

Candidates are requested to make their answers as brief as possible—brief and accurate. Each answer should be written on a separate sheet of paper, and subsequently the sheets should be fastened together in the left-hand corner. The top sheet should bear the name of the Candidate.

QUESTIONS.

1. What are the generally accepted principles of cheesemaking?
2. Describe (1) favourable and (2) unfavourable atmospheric influences on milk intended for making pressed cheese.
3. What is acidity, how is it caused, and what is its use in cheese-making?
4. Describe minutely the texture of a curd containing (1) .35 acid and (2) .55 acid at the time of vating.
5. What difference would you expect to find between ripe cheeses made from curd with (1) little acidity, (2) moderate acidity, and (3) much acidity?
6. Can the flavour of ripe cheese be influenced by the process of making—if so how?
7. Describe the making of any *one* of the following varieties of cheese: Cheddar, Cheshire, Stilton, or Wensleydale.
8. Describe the texture, flavour, and colour when ripe, of the kind you have selected in the previous question.
9. How can you distinguish between taints in milk due to feeding and those due to bacteria?
10. What is the active principle in rennet, and how does it act?
11. What causes “ripening” in cheese, and what are the chief changes which take place in ripening?
12. What are the effects of pasteurization on milk intended for cheese-making?

EXAMINATION FOR BUTTERMILKING, CHEESEMAKING,  
AND DAIRY TEACHERS' CERTIFICATES AT THE  
DAIRY DEPARTMENT, COUNTY LABORATORIES,  
CHELMSFORD; ON MONDAY, TUESDAY, AND  
WEDNESDAY, JULY 21ST, 22ND, AND 23RD, 1913.

EXAMINERS: DR. T. MILBURN and MR. F. J. LLOYD, F.C.S.

Three hours are allotted to Candidates for Dairy Teachers' Certificates, or both Butter and Cheese Making Certificates; and *one and half* hour to Candidates for either Cheesemaking or Buttermaking Certificates. Candidates will also be examined *viva voce*. Each question carries the same number of marks, and Candidates gaining over 60 per cent. will pass.

Candidates are requested to make their answers as brief as possible—brief and accurate. Each answer should be written on a separate sheet of paper, and subsequently the sheets should be fastened together in order in the left-hand corner.

*Candidates are required to answer the following questions:—*

FOR BUTTERMILKING CERTIFICATE ... Nos. 1 to 6 inclusive.  
FOR CHEESEMAKING CERTIFICATE ... Nos. 7 to 12 inclusive.  
FOR DAIRY TEACHERS' CERTIFICATE ... Nos. 1 to 15 inclusive.

### QUESTIONS.

1. What are the principal constituents present in milk? State after each what importance it has to the buttermaker.
2. Describe a method of estimating fat in milk, which you yourself are able to use.
3. Would you prefer thick or thin cream for butter-making? State why, and what percentage of fat would be present.
4. How do you know when cream is sufficiently ripe for butter making, and what advantages are gained by ripening cream?
5. What are the chief causes of:—
  - (a) Inferior butter (*i.e.* never of good quality)?
  - (b) Butter which, though good when made, rapidly deteriorates?
6. What amount of milk would you expect in a year from (a) an average Shorthorn; (b) an average Jersey? State the average percentage of fat in each milk, and the amount of butter each should yield in the year.

7. Why is it essential that care should be exercised in setting the night's milk intended for cheesemaking?
8. Describe fully, but briefly, the manufacture of Pont l'Eveque or Camembert cheese.
9. Name the circumstances which determine the rate at which a Cheddar cheese will ripen.
10. Give the cause, or causes, of discoloration in hard cheeses.
11. What is the approximate composition of Cheddar cheese, and in what important points does it differ from the composition of a soft cheese?
12. Can you account for the variations which are frequently necessary in the manufacture of cheese on different farms?
13. Compare the average composition of morning's milk with that yielded in the evening, when the intervals between milking are 14 and 10 hours respectively, and explain the causes of the difference.
14. Describe the various bacteria of importance in the dairy, state their sources, methods of growth, and effects on dairy produce.
15. Give the heads and sub-divisions of a course of 10 lectures which you would give to pupils at a 10 days' butter course.

EXAMINATION FOR BUTTERMILKING AND CHEESE-  
MAKING CERTIFICATES AT THE BRITISH DAIRY  
INSTITUTE, READING; ON MONDAY, TUESDAY,  
WEDNESDAY, AND THURSDAY, SEPTEMBER 1st, 2nd,  
3rd, AND 4th, 1913.

EXAMINERS: MR. JOSEPH RIGBY, MR. C. W. WALKER-TISDALE,  
and MR. F. J. LLOYD, F.I.C., F.C.S.

Candidates taking Butter and Cheese questions will be allowed three hours.

Candidates for Butter Certificates will be allowed two hours to answer questions 1-9 (5a).

Candidates for Cheese Certificates will be allowed two hours to answer questions 1-5 (b) (not 5a) and questions 10-13.

1. In milking, what do you mean by stripping, and what is the object of doing it?
2. What should be the average composition of milk at this time of the year?



3. State what you know of the properties of each of the constituents of milk.
4. Why does milk curdle when kept at a high temperature sooner than when kept at a low temperature? Explain fully what takes place.
5. In making (*a*) butter (*b*) cheese some of the fat present in the milk is lost. State where, and how much.
6. Why is cream ripened, and how do you know when it is properly ripe for buttermaking?
7. What results do you wish to obtain by washing the grains of butter in the churn?
8. What are the chief characteristics of inferior butter due (*a*) to faulty milk, and (*b*) to faulty manipulation?
9. What would you consider the average composition of good butter (*a*) made with brine, (*b*) dry salted?
10. Describe the treatment of the evening's milk where a cheese is made from the combined milkings.
11. What is the action of "acidity" on curd during the process of making a cheese?
12. Explain the use of a starter in cheesemaking and state the effects of its abuse.
13. What are the chief characteristics of inferior cheese due (*a*) to faulty milk, (*b*) to faulty manipulation?

EXAMINATION FOR DIPLOMAS AND DAIRY TEACHERS' CERTIFICATES AT THE BRITISH DAIRY INSTITUTE, READING: ON MONDAY, TUESDAY, WEDNESDAY, AND THURSDAY, SEPTEMBER 1ST, 2ND, 3RD, AND 4TH, 1913.

EXAMINERS: MR. JOSEPH RIGBY, MR. C. W. WALKER-TISDALE, and MR. F. J. LLOYD, F.C.S.

FIRST PAPER.

Three hours are allotted to Candidates to answer the questions contained on this sheet.

Candidates will also be examined *à la voce*. Each question carries the same number of marks, and Candidates gaining over 60 per cent. will pass.

Candidates are requested to make their answers as brief as possible—brief and accurate. Each answer should be written on a separate sheet of paper, and subsequently the sheets should be fastened together in order in the left-hand corner.

### **BUTTERMAKING QUESTIONS.**

1. If you obtain 1s. 4d. 1b. for butter, what price can you afford to pay for milk
  - (a) containing 3·7 per cent. of fat ;
  - (b) „ 5 „ „ ?
2. What is colostrum, and why is it undesirable to use it in butter-making ?
3. How would you determine if cream is sufficiently ripe for churning ? If churned when over or under ripe, how would the quality of the butter be affected ?
4. What do you mean by rancidity in butter ? State the causes, and how to prevent it.
5. To what is the natural colour of butter due ? State all the factors which affect the colour.
6. What special precautions would you take in order to produce butter having the best possible keeping qualities ?

### **CHEESEMAKING QUESTIONS.**

7. Describe the mixing of the morning's and evening's milk and the treatment of the cream.
8. Give a few simple tests for the purity and soundness of purchased milk to be used for making pressed cheese.
9. Discuss the relative importance of acidity, rennet, and salt.
10. Why is it that blue mould cheeses are made at lower temperatures than pressed cheeses ?
11. What effect, if any, has district or locality on milk, on cheese in its making, or on ripe cheese ?
12. What is discoloration in Cheshire and Stilton Cheese attributed to ? State the best means of preventing it.

### **DAIRYING QUESTIONS.**

13. What is centrifugal force ? How is it utilised in the cream separator ? How do the diameter and length of a bowl affect its separating power ?

14. Prepare a statement showing the returns that might be expected from a cow yielding 800 gallons of milk
  - (a) Where the milk is made into butter :
  - (b) Where the milk is sold wholesale.
15. Describe as you would to an elementary class the relative merits of a separator and shallow pans in a butter dairy.
16. State how you would examine and classify a number of samples of butter.

EXAMINATION FOR DIPLOMAS AND DAIRY TEACHERS'  
CERTIFICATES AT THE BRITISH DAIRY INSTITUTE,  
READING: ON MONDAY, TUESDAY, WEDNESDAY, AND  
THURSDAY, SEPTEMBER 1ST, 2ND, 3RD, AND 4TH, 1913.

EXAMINERS: MR. JOSEPH RIGBY, MR. C. W. WALKER-TISDALE,  
and MR. F. J. LLOYD, F.C.S.

SECOND PAPER.

Diploma Candidates will be allowed  $2\frac{1}{2}$  hours to answer the following questions :—

Three out of the four on Dairy Chemistry.

Three out of the four on Dairy Bacteriology.

Five out of the six on Agricultural Chemistry and Bacteriology.

Dairy Teacher Candidates will be allowed  $1\frac{1}{2}$  hours to answer the following questions :—

Three out of the four on Dairy Chemistry.

Three out of the four on Dairy Bacteriology.

**DAIRY CHEMISTRY QUESTIONS.**

1. What are the chemical constituents of milk, and what proportion of each would be present in milk containing 13 per cent. of total solids?
2. What system of milk testing can best be employed as an adjunct to a dairy record?

3. What chemical changes take place in the souring of milk, and what acidity is present when milk curdles?
4. In the manufacture of cheese what becomes of the lime present in the milk?

**DAIRY BACTERIOLOGY QUESTIONS.**

5. Describe what are the characteristics of the *bacillus acidi lactici* and the *streptococcus lacticus* respectively.
6. How do bacteria feed, and upon what constituents of milk do they mainly exist?
7. What is the best method of estimating the solid impurities in milk?
8. How would you examine microscopically such impurities?

**AGRICULTURAL CHEMISTRY AND BACTERIOLOGY QUESTIONS.**

9. State the percentage of the principal constituents of soils you would expect in good arable land?
10. If these constituents were deficient in pasture land, state for each one how you would endeavour to make good the deficiency.
11. What are the advantages and disadvantages of using nitrate of soda and sulphate of ammonia respectively as sources of nitrogen?
12. What is the average composition of barley meal, bran, and middlings?
13. In what respects chemically does an impure water differ from a pure drinking water?
14. What bacterial and chemical changes take place in farmyard manure (*a*) when badly made; (*b*) when well made?

EXAMINATION FOR DIPLOMAS AT THE BRITISH DAIRY INSTITUTE, READING; ON MONDAY, TUESDAY, WEDNESDAY, AND THURSDAY, SEPTEMBER 1ST, 2ND, 3RD, AND 4TH, 1913.

EXAMINERS: MR JOSEPH RIGBY, MR. C. W. WALKER-TISDALE,  
and MR. F. J. LLOYD, F.C.S.

**THIRD PAPER.**

Two hours are allotted to candidates for DIPLOMAS to answer the questions contained on this sheet.

Candidates will also be examined *viva voce*. Each question carries the same number of marks, and candidates gaining over 60 per cent. will pass.

Candidates are requested to make their answers as brief as possible, brief and accurate. Each answer should be written on a separate sheet of paper, and subsequently the sheets should be fastened together in order in the left-hand corner.

### DAIRY FARMING QUESTIONS.

1. For a dairy farm of 150 acres (three-quarters old pasture and one-quarter arable) state :—
  - (a) What amount of capital would be required.
  - (b) How many cows under good management could be kept where rearing is done and calving heifers brought in to take the place of draft cows.
  - (c) How many calves could be reared annually.
  - (d) How many 8-score bacon pigs should be reared for sale, and what foods would you give them.
2. What root crops do you consider best to grow for use in milk production, and why? Describe the cultivation and harvesting of a crop of mangels.
3. What are the requirements of the new "Tuberculosis Order" now in operation?
4. Describe the best method to employ for rearing calves on a farm where milk is sold.
5. What is meant by albumenoid ratio? Describe a ration suitable for a large dairy shorthorn cow in full milk in winter, and state the amount of digestible food constituents that should be present in such a ration.
6. Compare the feeding values of undecorticated and decorticated cotton cakes at their current prices.
7. What is the meaning of 26 per cent. soluble as applied to super-phosphate? How can you value artificial manures on the unit system? Give examples.

## EXAMINATION RESULTS, 1913.

### EXAMINATION FOR BUTTERMAKING AND CHEESEMAKING CERTIFICATES AT THE BRITISH DAIRY INSTITUTE, READING, ON TUESDAY, WEDNESDAY, AND THURSDAY, JUNE 10TH, 11TH, AND 12TH.

- A Certificate of Merit for Proficiency in the Theory and Practice of Butter-making and Cheesemaking to Miss Sarah Jones, Mohammed Rifaat, Miss Janet Jones, Miss Edith M. Lewis, Thomas H. Howard, Miss Laura M. Trevor, and Malcolm J. B. Shaw.
- A Certificate of Merit for Proficiency in the Theory and Practice of Butter-making to Miss Janet L. Buckell, Audrey Griffith, Miss Jessie M. Stuart, Miss Olive E. Rawson, James G. King, Miss Constance M. Stokes, Geoffrey L. Thomas, and Miss Nita M. D. Blyth.
- A Certificate of Merit for Proficiency in the Theory and Practice of Cheesemaking to Miss Marjory A. Smith.

### EXAMINATION FOR TEACHERS' BUTTER-MAKING AND CHEESE- MAKING CERTIFICATES AT THE COUNTY DAIRY SCHOOL, CHELMSFORD, ON MONDAY, TUESDAY, AND WEDNESDAY, JULY 21ST, 22ND, AND 23RD.

- A Teacher's Certificate for Proficiency in the Science and Practice of Dairying to Arthur G. Hill and Herbert W. Page.
- A Certificate of Merit for Proficiency in the Theory and Practice of Butter-making to Russell Sangster, Edwin J. Gain, Maurice Gain, Thomas B. Wiltshire, Laurence Wiltshire, James K. Hart, Miss Lilian M. Robins, Miss Dorothy Catling, Miss Eva M. Weir, Miss Phyllis M. Woollings, Miss Annie Garrard, and Miss Ethel B. Smith.

### EXAMINATION FOR DIPLOMAS AND CERTIFICATES AT THE BRITISH DAIRY INSTITUTE, READING, ON MONDAY, TUES- DAY, WEDNESDAY, AND THURSDAY, SEPTEMBER 1ST, 2ND, 3RD, and 4TH.

- A Diploma and Silver Medal for Proficiency in the Science and Practice of Dairying and Dairy Farming to Thomas K. Reith, Herbert W. Page, and Harold H. Gardner.
- A Teacher's Certificate for Proficiency in the Science and Practice of Dairying to Miss Muriel H. Monks and Miss Laura M. Trevor.
- A Certificate of Merit for Proficiency in the Theory and Practice of Butter-making to Ivan B. Spence, Miss Mary Palmer, Danlat R. Sethi, Harry M. Solomon, Leslie E. Cook, and William L. Moore.
- A Certificate of Merit for Proficiency in the Theory and Practice of Cheesemaking to James G. King.

# British Dairy Farmers' Association.

## MEDAL SCHEME.

### Special Prizes at Educational Institutions and Country Shows.

The Council of the British Dairy Farmers' Association is prepared to consider applications from Educational Centres and Approved Societies in the United Kingdom for their Silver and Bronze Medals to be awarded in connection with dairying and dairy farming under the following conditions, viz. :---

1. All applications must be made on the official form and must clearly state the object for which the Medal or Medals are required.
2. Only one application from any Institution or Society can be considered in any one year.
3. The application must be repeated annually if Medals are again required.
4. A copy of the Proposed Prize List, showing the Conditions of the Award of the Medal and the name of the judge, should accompany the application, and the offer of a Medal cannot be confirmed until the Prize List has been approved.
5. The British Dairy Farmers' Association stipulates that no entry fee shall be charged in respect of these Medals, they being offered as *Special Extra Prizes*.
6. Notification of the award, with the winner's full name and address, to be forwarded to the Secretary, British Dairy Farmers' Association, 28, Russell Square, London, W.C., within 14 days of the award being made.
7. A person may not receive more than one Medal under this Scheme for the same subject or exhibit during any one year.

In the event of any dispute as to the interpretation of these Rules, the Council of the British Dairy Farmers' Association reserve full power of decision, and in the event of the Medal not being awarded in accordance with the above Rules and Conditions, the Council reserve the right to withhold the Medal altogether.

By Order of the Council,

FREDERICK E. HARDCASTLE,

*Secretary.*

# AWARDS.

Name of Society.	Show or Examination held at	Date.	Medal	Winner and Object.
Monmouthshire Education Committee ...	Monmouth	Dec. 5, 1912	Silver	A. H. Marfell, for Buttermaking and Milking.
Fearith Association of Shorthorn Breeders	Penrith	.. ..	..	Robert Cock, for Shorthorn Dairy Cow "Modest Clara."
Wharfedale Agricultural Society	.. ..	May 2 & 3	..	J. A. Chapman & Son, for Pair of Dairy Cows.
Devon County Agricultural Association	Barnstaple	.. ..	..	Mrs. L. R. Mildon, for Scald Cream Butter.
Oxfordshire Agricultural Society	.. ..	21, 22 & 23	..	R. W. Hobbs & Sons, for Shorthorn Dairy Heifer "Rose 49th."
Leicestershire Agricultural Society	.. ..	21 & 22	..	Henry Neesham, for Dairy Cow "Cornwick Cherry II."
.. ..	Leicester	.. ..	..	Miss M. E. Holman, for Buttermaking.
.. ..	.. ..	28 & 29	Bronze	R. W. Hobbs & Sons, for Shorthorn Dairy Cow "Solo 60th."
Herefordshire and Worcester-shire Agricultural Society	Hereford	.. ..	Silver	John Pratt, for Shorthorn Dairy Cow "Fillpail 10th."
.. ..	.. ..	June 3, 4 & 5	..	Mrs. T. Kingwell, for Butter and Cream.
.. ..	.. ..	3, 4 & 5	Bronze	Mrs. A. A. Bera, for Butter.
Yealmonpton Agricultural Association	.. ..	.. ..	Silver	Miss Mildred Hills, for Buttermaking.
Wiltshire Agricultural Association	.. ..	4 & 5	..	John Robertson, for Ayrshire Cow.
Suffolk Agricultural Association	.. ..	.. ..	..	A. J. Hollington, for Dairy Cow "Matchless II."
Edinburgh Agricultural Association	.. ..	5 & 6	..	.. ..
Essex Agricultural Society	.. ..	11	..	.. ..
.. ..	Brantree	.. ..	..	.. ..
.. ..	.. ..	11 & 12	..	.. ..



## AWARDS.—Continued.

Name of Society.	Show or Examination held at	Date.	Medal.	Winner and Object.
Carlisle Agricultural Society ... ..	Carlisle ... ..	June 14 ... ..	Silver	Thomas For-yth, for Ayrshire Cow.
Kilkenny Agricultural Society ... ..	Kilkenny ... ..	" 19 ... ..	"	James Wilsdon, for Dairy Cow "Fancy."
Midland Agricultural and Dairy College ...	Kingston ... ..	July 6 ... ..	"	Miss Raby Dixon, for College Diploma.
Women's Agricultural and Horticultural Union	Regent's Park ... ..	" 10 ... ..	"	Miss D. Schultz, for Butter.
Wickhambrook and South Suffolk Colt Show Association	Long Melford ... ..	" 15 ... ..	"	Miss M. J. Page, for Buttermaking.
Malpas Agricultural Association ... ..	Malpas ... ..	" 16 ... ..	"	T. Emberton, for Dairy Cow.
" " " " " " " " " " " "	" " " " " " " " " " " "	" 16 ... ..	Bronze	A. Robinson, for Dairy Cow.
Bedfordshire Agricultural Society ... ..	Biggleswade ... ..	" 17 ... ..	Silver	B. Hawkins, for Dairy Cow.
Staffordshire Agricultural Society ... ..	Newcastle ... ..	" 23 & 24 ...	"	Miss F. Wright, for Butter.
Cambs and Isle of Ely Agricultural Society	Cambridge ... ..	" 24 ... ..	"	Miss N. Black, for Buttermaking and Dairy Work.
Welbeck Tenants' Agricultural Society ...	Welbeck ... ..	Aug 4 ... ..	"	F. B. Wilkinson, for Milch Cow "Sherwood Fanciful."
Berkeley Hunt Agricultural Society ... ..	Berkeley ... ..	" 4 ... ..	"	S. Cullimore, for 1st Prize Winner in Class 85.
Aird and Strathglass Agricultural Association	Beaufort ... ..	" 7 ... ..	"	John Fraser, for Butter.
Tring Agricultural Society ... ..	Tring ... ..	" 7 ... ..	"	Lord Lucas, for Shorthorn Dairy Cow "Lilac IV."

## AWARDS.—Continued.

Name of Society.	Show or Examination held at	Date.	Medal.	Winner and Object.
Wem and District Agricultural Society	Wem	Aug. 8.	Silver	John Mottershead, for Cheese.
"	"	"	"	"
"	"	"	"	"
Llandefiog Agricultural and Horticultural Society	Llandefiog	"	"	"
Central Banfishire Farmers' Club	Keith	"	"	"
Harrogate Agricultural Society	Harrogate	"	"	"
Sussex County Agricultural Society	Hastings	"	"	"
Penistone Agricultural Society	Penistone	"	"	"
Cheshire Agricultural Society	Chester	"	"	"
North-East Somerset Farmers' Club	Stanton Drew	"	"	"
Mid-Somerset Agricultural Society	Shepton Mallet	Sept. 2	"	"
"	"	"	"	"
"	"	"	"	"
Middlewich and District Agricultural Society	Middlewich	"	"	"
Thame Agriculture Association	Thame	"	"	"
Kilkenny Agricultural Society	Kilkenny	Oct. 2	"	"



## AWARD OF PRIZES, DAIRY SHOW, 1913.

### DAIRY COWS AND HEIFERS IN MILK.

- Class 1—SHORTHORN COWS.**—Entered in or eligible for Coates' Herd Book, or its pedigree sent for such entry previous to the Show.—*First* Inspection Prize (£10) to J. Ellis Potter, Moor Hall, Aughton, Ormskirk, for "Lady Clara." *Second* Inspection Prize (£5), *First* Milking Trial Prize (£20), and Shorthorn Society's Prize (£10) to Samuel Sanday, Puddington Hall, near Chester, for "Greenleaf 32nd." *Third* Inspection Prize (£3) and *Third* Milking Trial Prize (£5) to George B. Nelson, Cockerham Hall, near Garstang, for "Barbara 5th." *Fourth* Inspection Prize (£2) and *Second* Milking Trial Prize (£10) to R. W. Hobbs & Sons, Kelmscote, Lechlade, for "Rose 44th." *Fourth* Milking Trial Prize (£2) to H. FitzHerbert Wright, M.P., Yeldersley Hall, Derby, for "Red Rose A 2nd."
- Class 2—SHORTHORN HEIFERS**, not exceeding three years of age.—Entered in or eligible for Coates' Herd Book.—*First* Inspection Prize (£5) to George B. Nelson for "Cockerham Burthright." *Second* Inspection Prize (£3) and *Third* Milking Trial Prize (£2) to R. W. Hobbs & Sons, for "Rose 50th." *Third* Inspection Prize (£2) and *Second* Milking Trial Prize (£4) to R. W. Hobbs & Sons for "Spotless 31st." *Fourth* Inspection Prize (£1) to Samuel Sanday for "Puddington Blossom." *First* Milking Trial Prize (£7) to J. Moffat, Watercrook, Kendal, for "Lorna Doone." *Fourth* Milking Trial Prize (£1) to University Farm, Gravel Hill, Cambridge, for "Cantab Gwynne."
- Class 3—SHORTHORN COWS.**—Not eligible for Class 1.—*First* Inspection Prize (£10) to J. L. Shirley, Silverton, Bletchley, for "Silverton Fillpail." *Second* Inspection Prize (£5) to R. W. Hobbs & Sons for "Bertha 13th." *Third* Inspection Prize (£3), *Second* Milking Trial Prize (£10), and the Spencer Cup to Sam S. Rangill, The Grange, Ringway, Altrincham, for "Ruby." *First* Milking Trial Prize (£20), the Lord Mayor's Cup, Barham Cup, and Shirley Cup to F. B. Wilkinson, Cavendish Lodge, Edwinstowe, for "Sherwood Rose 2nd." *Third* Milking Trial Prize (£5) to A. P. Brandt, Bletchingley Castle, Bletchingley, for "Primrose."
- Class 4—SHORTHORN HEIFERS**, not exceeding three years of age.—Not eligible for Class 2.—*First* Inspection Prize (£5) and *Second* Milking Trial Prize (£4) to Hooker & Whittome, Whitgift Dairies, Croydon, for "Princess 2nd." *Second* Inspection Prize (£3) to Sam S. Rangill for "Rose." *Third* Inspection Prize (£2) and *First* Milking Trial Prize (£7) to J. W. Astley, Southfield, West Marton, Skipton, for "Southfield Belle." *Third* Milking Trial Prize (£2) to Joseph Brandon, Horton Hall Farm, Leighton Buzzard, for "Dorothy."
- Class 5—LINCOLNSHIRE RED SHORTHORN COWS.**—Entered in or eligible for the Herd Book of the Lincolnshire Red Shorthorn Association.—*First* Inspection Prize (£10) and *Second* Milking Trial Prize (£10) to John Evens, Burton, near Lincoln, for "Burton Ruby 15th." *Second* Inspection Prize (£5) to Chas. E. Scorer, Bracebridge Heath, Lincoln, for "Bracebridge No. 188B." *Third* Inspection Prize (£3) and *Third* Milking Trial Prize (£5) to John Evens for "Burton Irene." *First* Milking Trial Prize (£20) to Chas. E. Scorer for "Bracebridge No. 189."
- Class 6—LINCOLNSHIRE RED SHORTHORN HEIFERS**, not exceeding three years of age.—Entered in or eligible for the Herd Book of the Lincolnshire Red Shorthorn Association.—*First* Inspection Prize (£5) and *Second* Milking Trial Prize (£4) to John Evens for "Burton Pride 12th." *Second* Inspection Prize (£3) and *First* Milking Trial Prize (£7) to John Evens for "Burton Amy 4th." *Third* Inspection Prize (£2) to H. Neesham, Lodge Farm, Canwick, near Lincoln, for "Canwick Buttercup."

**Class 7.—JERSEY COWS.**—Entered in or eligible for the Herd Book.—*First Inspection Prize* (£7) to A. Miller-Hallett, Goddington, Chelsfield, for "La Franchise 3rd." *Second Inspection Prize* (£4) to Jersey de Knoop, Calveley Hall, Tarporley, for "Anger's Distinction." *Third Inspection Prize* (£2) and Blythwood Bowl to Joseph Brutton, 7, Princes Street, Yeovil, for "Irish Lass." *First Milking Trial Prize* (£15) to J. H. Smith-Barry, Stowell Park, Pewsey, for "Malmsey." *Second Milking Trial Prize* (£10) to J. H. Smith-Barry for "Promise." *Third Milking Trial Prize* (£5) to J. Carson, Crystalbrook, Theydon Bois, for "Pamela 2nd."

**Class 8.—JERSEY HEIFERS**, not exceeding three years of age.—Bred in Great Britain or Ireland.—Entered in or eligible for the Herd Book. *First Prize* (£7) to J. H. Smith-Barry for "Lightsome." *Second Prize* (£4) to Viscount Enfield, Dancers Hill, South Mimms, for "Circe." *Third Prize* (£2) to A. Miller-Hallett for "Goddington Pipkin 6th."

**Class 9.—JERSEY HEIFERS**, not exceeding three years of age.—Bred in Channel Islands.—Entered in or eligible for the Jersey or English Jersey Herd Book.—*First Prize* (£7) to A. Miller-Hallett for "My Pallas." *Second Prize* (£4) to J. Carson for "Bernadette's Fairy." *Third Prize* (£2) to A. E. Renout, Elmhurst Park, Reading, for "Manor Carnation Lady."

**Class 10.—GUERNSEY COWS.**—Entered in or eligible for the Herd Book.—*First Inspection Prize* (£7) and *Third Milking Trial Prize* (£5) to J. F. Remnant, M.P., The Grange, Twyford, Berks, for "Treacle 3rd." *Second Inspection Prize* (£4) and *First Milking Trial Prize* (£15) to H. Fitzwalter Plumtre, Goodnestone Park, Canterbury, for "Donnington Juno" (8041). *Third Inspection Prize* (£2) to J. F. Remnant, M.P., for "Gold Cup of Hatch 2nd." *Second Milking Trial Prize* (£10) to G. Oskey, Brittleware Farm, Charlwood, for "Brittleware Ivy."

**Class 11.—GUERNSEY HEIFERS**, not exceeding three years of age.—Entered in or eligible for the Herd Book.—*First Prize* (£7) to A. W. Bailey Hawkins, Stagenhoe Park, Welwyn, Herts, for "Merton Beauty." *Second Prize* (£4) to F. H. Norman, Moor Place, Much Hadham, Herts, for "Goldstream 5th."

**Class 12.—RED POLL COWS.**—Entered in or eligible for the Herd Book.—*First Inspection Prize* (£7), *First Milking Trial Prize* (£15), and the Red Poll Cattle Society's Prize (£5) to Kenneth M. Clark, Sudbourne Hall, Orford, Suffolk, for "Sudbourne Flight" (22359). *Second Inspection Prize* (£4) to John E. Hill, Park Farm, Gressenhall, Dereham, for "Poppy 6th" (22223). *Third Inspection Prize* (£2) and *Third Milking Trial Prize* (£5) to Kenneth M. Clark for "Sudbourne Beautiful" (21447). *Second Milking Trial Prize* (£10) to Kenneth M. Clark for "Sudbourne Queen 1st" (20122).

**Class 13.—RED POLL HEIFERS**, not exceeding three years of age.—Entered in or eligible for the Herd Book.—*First Inspection Prize* (£5) and *Third Milking Trial Prize* (£2) to Marchioness of Graham, Easton Park, Wickham Market, for "The League." *Second Inspection Prize* (£3), *First Milking Trial Prize* (£5), and the Red Poll Cattle Society's Prize (£5) to C. L. Blundell, Halsall House, near Ormskirk, for "Rendlosham Lady Maud" (22756). *Third Inspection Prize* (£2) and *Second Milking Trial Prize* (£3) to Kenneth M. Clark for "Sudbourne Berry" (23311).

**Class 14.—AYRSHIRE COWS.**—*First Inspection Prize* (£7) and *Second Milking Trial Prize* (£10) to C. Randolph Dudgeon, Cargen Holm, Dumfries, for "Charlotte" (29418). *Second Inspection Prize* (£4) to C. Randolph Dudgeon for "Balgreddan Hughina" (26802). *First Milking Trial Prize* (£15) to M. E. Heaton, Harleyford Home Farm, Marlow, Bucks., for "Harleyford Jeanie."

**Class 15.—SOUTH DEVON COWS.**—*First Inspection Prize* (£7) to Andrew Rogers, Brownstone, Yealampton, for "Dahlia 2nd" (5960). *Second Inspection Prize* (£4) and *First Milking Trial Prize* (£15) to Page & Whitley, Warren Hall, Broughton, near Chester, for "Sunbeam's Bluebell" (6404).

**Class 16—KERRY COWS.**—Entered in or eligible for the Herd Book.—*First Inspection Prize* (£7) to T. Waite, Highlands, Redhill, Surrey, for "Raheny" (707). *Second Inspection Prize* (£4) and *First Milking Trial Prize* to L. Currie, 130, Mount Street, London, W., for "Minley Princess."

**Class 17—DEXTER COWS.**—Entered in or eligible for the Herd Book.—(No Entry.)

**Class 18—PAIR OF COWS OF ANY BREED OR CROSS** (in milk).—*First Prize* (£20) to J. Moffat for "Lady Watercrock" and "Watercrock Princess." *Second Prize* (£15) to A. Stansfield, The Calliards, Smithy Bridge, Rochdale, for "Mona 3rd" and "Mona 4th." *Third Prize* (£10) to Sam S. Raingill for "Dainty" and "Faithful." *Fourth Prize* (£5) to Lady Thursby, Omerod House, Burnley, for "Bridget" and "Honeysuckle" (Shorthorns). *Fifth Prize* (£3) to W. R. Withers, Lower Court Farm, Long Ashton, Bristol, for "Pansy" and "Daisy."

**Class 19—SINGLE COW OF ANY BREED OR CROSS** (in milk).—*First Prize* (£10) to George B. Nelson for "Ella" (Shorthorn). *Second Prize* (£7) to F. B. Wilkinson for "Kate." *Third Prize* (£5) to J. W. Astley for "Southfield Ethel" (Shorthorn). *Fourth Prize* (£3) to T. Morley, Gallants Farm, Whetstone, for "Queenie" (Shorthorn). *Fifth Prize* (£2) to T. E. Clarke, Harwood Lodge, near Bolton, for "Nellie."

The animals in Classes 18 and 19 were used in connection with the Milkers' Contests.

#### BUTTER TESTS.

**SHORTHORNS** entered in Classes 1, 2, 3, 4, 5, and 6.—*First Prize* (£5 and Silver Medal) to Sam S. Raingill for "Ruby." *Second Prize* (£4 and Bronze Medal) to John Evens for "Burton Irene." *Third Prize* (£3) to Chas. E. Scorer for "Bracebridge No. 189." *Fourth Prize* (£2) to J. W. Astley for "Southfield Dora." *Fifth Prize* (£1) to Samuel Sanday for "Greenleaf 32nd."

**JERSEYS** entered in Classes 7, 8, and 9, and eligible for the English Jersey Herd Book.—*First Prize* (Gold Medal or £10) to J. H. Smith-Barry for "Promise." *Second Prize* (Silver Medal) to J. H. Smith-Barry for "Malmsey." *Third Prize* (Bronze Medal) to J. Carson for "Pamela 2nd."

**ANY OTHER BREED** entered in Classes 10 to 17 inclusive.—Prizes of £3 each to Sir H. F. Lennard, Bart., for "Wickham Fancy 2nd" (Guernsey); to Page and Whitley for "Sunbeam's Bluebell" (South Devon). Prize of £1 to H. Fitzwalter Plumtre for "Downington Juno" (Guernsey).

#### BULLS.

**Class 20—SHORTHORN BULLS**, twelve months old or over.—Entered in or eligible for the Herd Book.—*First Prize* (£10) to Samuel Sanday for "Barrington Snowstorm" (110940). *Second Prize* (£5) to Robert Heath, Biddulph Grange, Biddulph, Staffs, for "Puddington Rosador." *Third Prize* (£3) to J. & H. Robinson, Iford, Lewes, for "Ursula's Priceless Prince" (107353).

**Class 21—JERSEY BULLS**, above one year and not exceeding three years.—Entered in or eligible for the Herd Book.—*First Prize* (£10) to J. Carson for "Combination's Knight." *Second Prize* (£5) to Jersey de Knoop for "Calveley Beau." *Third Prize* (£3) to Mrs. Sarah A. Towler, Wadlands Hall, Farsley, near Leeds, for "Wotton Illustrious Commodore."

**Class 22—BULLS OF ANY OTHER PURE BREED**, twelve months old or over.—Entered in or eligible for the Herd Book.—*Silver Medal* to A. Carlyle Smith, Sutton Hall, Woodbridge, Suffolk, for "Ashmoor Cornflower" (Red Poll).

#### BREEDERS' PRIZES.

**SILVER MEDAL TO EACH FIRST PRIZE COW, HEIFER, OR BULL IN THE SHOW.**—To J. Hope for Shorthorn Cow, "Greenleaf 32nd"; R. Cock for Shorthorn Cow, "Lady Clara"; T. Watson for Shorthorn Heifer, "Lorna Doone"; Hooker & Whittome for Shorthorn Heifer, "Princess 2nd"; F. Scorer for

Lincolnshire Red Shorthorn Cow, "Bracebridge No. 189"; John Evens for Lincolnshire Red Shorthorn Cow, "Burton Ruby 15th"; John Evens for Lincolnshire Red Shorthorn Heifer "Burton Pride 12th"; John Evens for Lincolnshire Red Shorthorn Heifer, "Burton Amy 4th"; J. G. D. Renouf for Jersey Cow "La Franchise 3rd"; J. H. Smith-Barry for Jersey Cow, "Malmscy"; J. H. Smith-Barry for Jersey Heifer, "Lightsome"; C. Fossey for Jersey Heifer, "My Pallas"; A. C. Harris for Guernsey Cow, "Donnington Juno"; J. Borrer for Guernsey Cow, "Treacle 3rd"; W. J. Empson for Guernsey Heifer, "Merton Beauty"; Kenneth M. Clark for Red Poll Cow, "Sudbourne Flight" (22359); Marchioness of Graham for Red Poll Heifer, "The League"; A. J. Smith for Red Poll Heifer, "Rendlesham Lady Maud" (22756); Homer Young for Ayrshire Cow, "Charlotte" (29418); Mr. Sloan for Ayrshire Cow, "Harleyford Jeanie"; D. Camp for South Devon Cow, "Sunbeam's Bluebell" (6404); H. Helmer for South Devon Cow, "Dahlia 2nd" (5960); R. Tait Robertson for Kerry Cow, "Minley Princess"; R. Tait Robertson for Kerry Cow, "Raheny" (707); Samuel Sanday for Shorthorn Bull, "Barrington Snowstorm" (110940); J. Carson for Jersey Bull, "Combination's Knight."

#### SHE-GOATS.

**Class 23—MILKING COMPETITION FOR GOATS (any Variety).** *First Prize* (Silver Medal and £2 10s., and the Baroness Burdett-Coutts Challenge Cup), to Miss Elsie Mortimer, Wigmere, Holmwood, Surrey, for "Wigmere Cornflower." *Second Prize* (£1 10s.) to Miss Elsie Mortimer for "Cowslip 3rd." *Third Prize* (£1) to Miss Vera Flood Page, Westwood, Normandy, near Guildford, for "Ira Conny." *Fourth Prize* (10s.) to Mrs. J. C. Straker, The Leazes, Hexham, for "Leazes Eve."

**Class 24—SHE-GOATS OF ANY VARIETY** that have won two or more *First Prizes* in Classes other than for Kids or Goatlings, on or before September 5th, 1913. -- *First Prize* (£2) to Miss Elsie Mortimer for "Wigmere Cornflower."

**Class 25—SHE-GOATS, SWISS OR ANGLO-SWISS**, being any She-Goat bred from English and any recognised breed or breeds of Swiss Goats without any admixture of Anglo-Nubian or other blood for at least six generations on both sides (over two years), not eligible for Class 24.—*First Prize* (£2) to Mrs. C. J. Billson, The Priory, Martyr Worthy, near Winchester, for "Cophorne Maisie." *Second Prize* (£1 and Bronze Medal) to Mrs. J. C. Straker for "Devonia." *Third Prize* (10s.) to Mrs. Handley Spicer, Brooklands House, Chobham, for "Witdean Babette."

**Class 26—SHE-GOATS, ANGLO-NUBIAN**, being any Goat entered in the Anglo-Nubian Section of the Herd Book, or eligible for entry therein (over two years), not eligible for Class 24.—*First Prize* (£2) to Mrs. Reginald Pearce, Sadberge Hall, Middleton St. George, for "Sadberge Stonechat." *Second Prize* (£1) to Miss Elsie Mortimer for "Wigmere Tansy." *Third Prize* (10s.) to Miss Elsie Mortimer for "Wigmere Thorn."

**Class 27—SHE-GOATS, ANY OTHER VARIETY.**—Not eligible for previous classes. Over two years on October 1st, 1913.—*First Prize* (£2 and British Goat Society's Cup) to Mrs. J. C. Straker for "Leazes Lupin." *Second Prize* (£1) to Mrs. C. J. Billson for "Cophorne Snowdrop." *Third Prize* (10s.) to M. E. Mitchell, Grange House, Levenshulme, Manchester, for "Hawthorne Granite."

**Class 28—GOATLINGS, SWISS OR ANGLO-SWISS**, being any Goatling bred from English and any recognised breed or breeds of Swiss Goats without any admixture of Anglo-Nubian or other blood for at least six generations on both sides (over one but not over two years).—*First Prize* (£2) to Mrs. Handley Spicer for "Cophorne Nutmeg." *Second Prize* (£1 and Bronze Medal) to Mrs. J. C. Straker for "Halton Hecuba." *Third Prize* (10s.) to Mrs. J. Taylor Marsh, Scriventon, Speldhurst, Kent, for "Oadby Blackthorne."

- Class 29**—**GOATLINGS, ANGLO-NUBIAN**, being any Goatling entered in the Anglo-Nubian Section of the Herd Book, or eligible for entry therein (over one but not over two years).—*First Prize (£2) to Lady Gertrude Crawford, Coxhill, Lympington, Hants, for "Coxhill Piffle."* *Second Prize (£1) to Mrs. Reginald Pease for "Bricket Beryl."* *Third Prize (10s.) to Lady Gertrude Crawford for "Coxhill Mollycoddle."*
- Class 30**—**GOATLINGS, ANY OTHER VARIETY** (over one but not over two years), not qualified for Classes 28 or 29.—*First Prize (£2) to Mrs. Handley Spicer for "Cophorne Walnut."* *Second Prize (£1) to Miss Vera Flood Page for "Cophorne Almond."* *Third Prize (10s.) to Dr. S. H. Snell, Christchurch, Hants, for "Farnham Asphodel."*
- Class 31**—**FEMALE KIDS, SWISS OR ANGLO-SWISS**, being any Kid bred from English and any recognised breed or breeds of Swiss Goats without any admixture of Anglo-Nubian or other blood for at least six generations on both sides (not over one year).—*First Prize (£2) to Mrs. Handley Spicer for "Cophorne Emeralds."* *Second Prize (£1) to Mrs. C. J. Billson for "Oadby Daphne."* *Third Prize (10s.) to Miss Elsie Mortimer for "Wigmore Geranium."*
- Class 32**—**FEMALE KIDS, ANGLO-NUBIAN**, being any Kid entered in the Anglo-Nubian Section of the Herd Book, or eligible for entry therein (not over one year).—*First Prize (£2) to Miss Elsie Mortimer for "Woodland Nina."* *Second Prize (£1) to Mrs. Reginald Pease for "Sadberge Petrel."* *Third Prize (10s.) to Lady Arthur Cecil, The Mount, Lympington, Hants, for "Forest Ragamuffin."*
- Class 33**—**FEMALE KIDS, ANY OTHER VARIETY** (not over one year), not qualified for Classes 31 or 32.—*First Prize (£2) to Mrs. Handley Spicer for "Cophorne Jezebel."* *Second Prize (£1) to Miss Elsie Mortimer for "Wigmore Snowdrop."* *Third Prize (10s.) to Mrs. Reginald Pease for "Sadberge Parmigan."*

#### CHEESE.

(For Makers only, residing in any part of the United Kingdom.)

- Class 34**—**CHEDDAR (4 Cheeses)**—*First Prize (£10) to A. Warren, Symes Dairy, North Perrott, Crewkerne.* *Second Prize (£7) to Alexander Cross, Knockdon, Maybole, Ayrshire.* *Third Prize (£5) to J. Sage, Batcombe, Evercech.* *Fourth Prize (£3) to R. Stevenson, Boghead, Galston, Ayrshire.* *Fifth Prize (£2) to W. C. Spencer, Manor Farm, Hillfield, Cattistock.*
- Class 35**—**CHEDDAR (20 Cheeses)**.—*First Prize (Silver Medal and £10) to E. E. Hoddinott, Manor Court Farm, Trowle, Trowbridge.* *Second Prize (£7) to R. Stevenson.* *Third Prize (£5) to J. Sage.* *Fourth Prize (£3) to E. J. Cary, Whitehouse Farm, South Brewham, Bruton.* *Fifth Prize (£2) to Cary & Portch, East Pennard, Shepton Mallett.*
- Class 36**—**CHEDDAR TRUCKLES (6 Cheeses)**.—*First Prize (£5) to H. H. Pickford, Westlands, Melksham.* *Second Prize (£3) to Alexander Cross.* *Third Prize (£2) to W. B. White, Lower Farm, Austy, Dorchester.*
- Class 37**—**CHESHIRE (4 Coloured Cheeses, not less than 40 lbs. each)**.—*First Prize (£10) and Captain R. W. Ethelston Cup, to John Dutton, Stretton Hall, Malpas, Cheshire.* *Second Prize (£5) to Chas. E. Parton, Houghton Hall Farm, Tarporley.* *Third Prize (£2) to J. Bibby & Sons, Hall-o'-Coole, Nantwich.*
- Class 38**—**CHESHIRE (4 Uncoloured Cheeses, not less than 40 lbs. each)**.—*First Prize (£10) to J. Bibby & Sons, Hall-o'-Coole, Nantwich.* *Second Prize (£5) to George Watson, Knightley, Eccleshall, Staffs.* *Third Prize (£2) to W. H. Hobson, Gonsley Farm, Blakenhall, Nantwich.*
- Class 39**—**CHESHIRE (4 Cheeses)**.—(Open to those who have never won a first or second prize at the London Dairy Show. The prizes in this class are generously given by Capt. R. W. Ethelston).—*First Prize (£10) to Richard W. Cooper, Bickerton, Malpas.* *Second Prize (£5) to Mrs. T. Stubbs, Upper Marston Farm, Stafford.* *Third Prize (£2) to John Dutton.*



**Class 40—CHESHIRE (20 Cheeses).—***First Prize* (Silver Medal and £10) to Mrs. E. Hallmark, New House Farm, Bettisfield, Whitechurch. *Second Prize* (£5) to George Lewis, Fernhill Factory, Market Drayton. *Third Prize* (£3) to E. Lockett, Moreton Wood, Whitechurch. *Fourth Prize* (£2) to William Kelsal, Bettisfield Hall, Whitechurch.

**Class 41—STILTON (6 Cheeses).—***First Prize* (£10) and the Lord Mayor's Cup to Mrs. M. Skinner, Hill Farm, Long Clawson, Melton Mowbray. *Second Prize* (£5) to Henry Morris, Manor Farm, Saxelby, Melton Mowbray. *Third Prize* (£2) to Belvoir Vale Dairies, Harby, Melton Mowbray.

**Class 42—STILTON (36 Cheeses).—***First Prize* (Silver Medal and £10) to Belvoir Vale Dairies. *Second Prize* (£5) to Tuxford & Nephews, Thorpe End Dairy, Melton Mowbray. *Third Prize* (£2) to Scaford Dairy Ltd., Scaford, Melton Mowbray.

**Class 43—WENSLEYDALE (Blue Moulded, 6 Cheeses).—***First Prize* (£5) to Alfred Rowntree, The Dairy, Coverham, Middleham. *Second Prize* (£3) to British Dairy Institute, Reading. *Third Prize* (£2) to Miss Clapp, Studley College, Studley, Warwickshire.

**Class 44—LANCASHIRE (4 Cheeses).—***First Prize* (£5) to Arthur Ross, School Farm, Great Eccleston, Garstang. *Second Prize* (£3) to John Wilson, Brookfield Cottam, near Preston. *Third Prize* (£2) to John Bee, Bulsnape Hall, Goosnargh, near Preston.

**Class 45—DOUBLE GLOSTER (4 Cheeses, from 26 lbs. to 30 lbs. each, total weight not to exceed 120 lbs.).—***First Prize* (£5) to Miss E. M. Lewis, King's Hill, Berkeley, Glos. *Second Prize* (£3) to P. Swain, Bellevue Dairy, Wem, Salop. *Third Prize* (£2) to E. White, Muckdeford Dairy, Grimstone, Dorchester.

**Class 46—SINGLE GLOSTER (4 Cheeses, from 13 lbs. to 15 lbs. each, total weight not to exceed 60 lbs.).—***First Prize* (£5) to Miss E. M. Lewis, King's Hill, Berkeley, Glos. *Second Prize* (£3) to Lawford Shield, Alkington Farm, Berkeley, Glos. *Third Prize* (£2) to H. J. Weedon, Wolfeton Dairy, Dorchester.

**Class 47—LEICESTER (4 Cheeses).—***First Prize* (£5) to Mrs. A. M. E. Bowmer, The Hays, Barrow-on-Soar, Leicestershire. *Second Prize* (£3) to Warwickshire County Council, Griff House, Nuneaton.

**Class 48—DERBY (4 Uncoloured Cheeses, not less than 25 lbs. each).—***First Prize* (£5) to P. Earp, Cheese Factory, Waterhouses, near Ashbourne. *Second Prize* (£3) to Cheddar Valley Dairy Co., Ltd., 47, City Road, Cardiff. *Third Prize* (£2) to Croxden Dairy Association, Croxden, Rocester, Stafford.

**Class 49—CAERPHILLY (4 Cheeses, not exceeding 8 lbs. each).—***First Prize* (£5) to Wilts United Dairies, Ltd., Trowbridge, Wilts. *Second Prize* (£3) to T. Dennehy, Dicksgrove Creamery, Farranfore, Co. Kerry. *Third Prize* (£2) to Wm. Sugden, The Dairy, Ffairfach, Llandilo, S. Wales.

**Class 50—CREAM CHEESE (made from pure cream only; no milk or curd to be added; 6 Cheeses).—***First Prize* (£2) to Miss A. J. Perkins, 1, High Street, Gosport, Hants. *Second Prize* (£1) to Brooklands Dairy, 39, Elm Grove, Southsea. *Third Prize* (10s.) to J. H. Cash, Shortwood Farm, Redditch.

**Class 51—GERVAIS (6 Cheeses).—***First Prize* (£1) to Horticultural College, Swanley, Kent. *Second Prize* (10s.) to Mrs. A. Martin, Tregavethan, Truro.

**Class 52—UNRIPENED SOFT CHEESE (other than Cream Cheese or Gervais, made direct from milk; 4 Cheeses).—***First Prize* (£1) to Mrs. W. Howard Palmer, Marrell Hill, Binfield, Berks. *Second Prize* (10s.) to Horticultural College, Swanley, Kent.

COLONIAL CHEESE.

(Open to Makers only.)

- Class 53—CHEDDAR (Coloured or Uncoloured : 4 Cheeses, not less than 60 lbs. each).—*First Prize* (Silver Medal and £5) to Tariki Co-operative Dairy Co., Ltd., Inglewood, Taranaki, New Zealand. *Second Prize* (Bronze Medal and £3) to Kaupokonui Co-operative Dairy Co., Ltd., Hawera, Taranaki, New Zealand. *Third Prize* (£2) to Hawera Co-operative Dairy Co., Ltd., Hawera, Taranaki, New Zealand.

COLLECTIONS OF DAIRY PRODUCE.

- Class 54—COLLECTION OF BRITISH DAIRY PRODUCE.—(No Entry.)

- Class 55—COLLECTION OF COLONIAL DAIRY PRODUCE.—Silver Medal to Commonwealth of Australia, 72, Victoria Street, London, S.W.

BACON AND HAMS.

(Open to Curers only, residing in any part of the United Kingdom.)

(Classes 59, 64, 65, and 66 excepted.)

- Class 56—PALE DRIED BACON (4 hamless sides of spring or winter cure).—*First Prize* (Silver Medal) to Joseph Smith, Cummersdale, near Carlisle. *Second Prize* (Bronze Medal) to T. Marshall & Son, Dore, near Sheffield.
- Class 57—SMOKED BACON (4 sides, mild cured in Wiltshire style, with ham attached).—*First Prize* (Silver Medal) to M. Venner & Sons, Reading. *Second Prize* (Bronze Medal) to Dunmow Flitch Bacon Co., Ltd., Dunmow, Essex.
- Class 58—PALE DRIED BACON (4 sides, mild cured in Wiltshire style, with ham attached).—*First Prize* (Silver Medal) to Herts and Beds Bacon Factory, Ltd., Hitchin. *Second Prize* (Bronze Medal) to Colin & Co., Ltd., Burton Street, Melton Mowbray.
- Class 59—TWO SIDES OF BACON SMOKED, and TWO SIDES OF BACON PALE DRIED (weight not less than 56 lbs. per side, and not more than 68 lbs. per side).—*First Prize* (British Empire Trophy, value £15 15s.) to Herts and Beds Bacon Factory, Ltd., Hitchin. *Second Prize* (Cup, value £5 5s.) to M. Venner & Sons, Reading. *Third Prize* (Cup, value £2 2s.) to Hilliers Bacon Curing Co., Ltd., Newmarket Stroud.
- Class 60—PALE DRIED HAMS (4 hams, long cut of winter or spring cure, not over 14 lbs. weight).—*First Prize* (Silver Medal) to Palethorpes, Ltd., Dudley Port, Staffs. *Second Prize* (Bronze Medal) to Walker & Son (Leicester), Ltd., 4, Cheapside, Leicester.
- Class 61—PALE DRIED HAMS (4 hams, long cut, of winter or spring cure, over 14 lbs. weight).—*First Prize* (Silver Medal) to Joseph Smith. *Second Prize* (Bronze Medal) to Palethorpes, Ltd.
- Class 62—SMOKED HAMS (4 hams, long cut, mild cured, not over 15 lbs. weight).—*First Prize* (Silver Medal) to Palethorpes, Ltd. *Second Prize* (Bronze Medal) to Charles Prideaux, The Grange, Motcombe, Dorset.
- Class 63—PALE DRIED HAMMS (4 hams, long cut, mild cured, not over 10 weeks cured, over 15 lbs. weight).—*First Prize* (Silver Medal) to Palethorpes, Ltd. *Second Prize* (Bronze Medal) to Joseph Smith.
- Class 64—SMOKED HAMS (4 hams, cured in Ireland, under 14 lbs. weight). (No Entry.)
- Class 65—TWO HAMS (cured in the farmhouse or home; professional bacon curers not eligible).—*First Prize* (£2) to John Johnson, Brick-Kiln Lane Banks, near Southport. *Second Prize* (£1) to Thomas Welsby, High Street, Mold, N. Wales.
- Class 66—SELLING CLASS FOR HAMS (any variety) (2 hams).—*First Prize* (£2) to Palethorpes, Ltd. *Second Prize* (£1) to Joseph Rigby, South Croxton, Leicester. *Third Prize* (10s.) to T. Marshall & Son.

## BUTTER.

(Open to Makers only, residing in any part of the United Kingdom.)

- Class 67**—BUTTER, slightly Salted, open only to farmers, their wives, sons, and daughters, occupying not exceeding 100 acres, and who have never won a Prize in the Butter Classes at any of the Society's Shows. 2 lbs. in 1-lb. lumps.—*First Prize* (£3) to Miss Mary A. Cowell, Callows Hill, Ledbury, Hereford. *Second Prize* (£2) to Miss P. Holden, Nixon's Farm, Deane, Bolton. *Third Prize* (£1) to A. Lewis & Son, Manor Farm Dairy, Burley, Ringwood, Hants.
- Class 68**—BUTTER, perfectly free from Salt, the produce of Channel Islands Cattle and their Crosses. 2 lbs. in 1-lb. lumps.—Three *Equal First Prizes* (£3 each) to J. H. Hearn, Churchtown, Sydenham Damarel, Devon; Mrs. John Way, West Bridge, Bishop's Nympton, South Molton; Mrs. L. R. Mildon, Mead Down, Rackenford, N. Devon. Three *Equal Second Prizes* (£2 each) to Mrs. A. A. Bere, Stoodleigh Barton, near Tiverton, Devon; George Venning, Langunnett Barton, Lerryn, Lostwithiel, Cornwall; Maurice Bullock, Bodieve, Wadebridge, Cornwall. Three *Equal Third Prizes* (£1 each) to S. F. Edge, Gallops Homestead, Ditchling, Sussex; Miss M. R. Ferguson, Old Town, Southwaite, Carlisle; Miss Wilmot J. Eddy, Trendrine Farm, St. Ives, Cornwall.
- Class 69**—BUTTER, slightly Salted, the produce of Channel Islands Cattle and their Crosses. 2 lbs. in 1-lb. lumps.—Three *Equal First Prizes* (£3 each) to Mrs. John Way; Mrs. W. Irving, Toppin Castle, Heads Nook, Carlisle; Mrs. L. R. Mildon. Three *Equal Second Prizes* (£2 each) to Mrs. A. A. Bere; H. P. Sturgis, Givons, Leatherhead, Surrey; Maurice Bullock. Three *Equal Third Prizes* (£1 each) to Mrs. Oxenham, Burntown, near Tavistock, Devon; Miss M. R. Ferguson; Mrs. Priestley, Little Missenden Abbey, Great Missenden.
- Class 70**—BUTTER, perfectly free from Salt, the produce of Shorthorn and other Cattle and their Crosses (except Channel Islands and their Crosses). 2 lbs. in 1-lb. lumps.—Three *Equal First Prizes* (£3 each) to Mrs. W. Irving; Mrs. George Adlam, Bubwith Farm, Wookey Hole, Wells; Mrs. L. R. Mildon. Three *Equal Second Prizes* (£2 each) to Mrs. A. A. Bere; Mrs. G. B. Robinson, Poole House Farm, Nantwich; Miss M. R. Ferguson. Three *Equal Third Prizes* (£1 each) to George Venning; Lord Burnham, Hall Barn, Beaconsfield; J. H. Hearn.
- Class 71**—BUTTER, slightly Salted, the produce of Shorthorn and other Cattle and their Crosses (except Channel Islands and their Crosses). 2 lbs. in 1-lb. lumps.—Three *Equal First Prizes* (£3 each) to Mrs. L. R. Mildon; Maurice Bullock; Thomas Miles, Holwell, near Sherborne, Dorset. Three *Equal Second Prizes* (£2 each) to Mrs. W. Irving; J. H. Hearn; Mrs. George Adlam. Three *Equal Third Prizes* (£1 each) to Miss D. M. Shaw, Kitchen Grounds, Ellet, Lancaster; Mrs. W. Ramshaw, Kirkleatham Dairy, Redcar; Lord Burnham.
- Class 72**—BUTTER, slightly Salted. 2 lbs. in 1-lb. lumps.—Two *Equal First Prizes* (£3 each) to H. P. Sturgis; Mrs. A. Underwood, Coombe Farm, Little Gaddesden, Berkhamsted. Two *Equal Second Prizes* (£2 each) to Mrs. W. Irving; J. H. Hearn. Two *Equal Third Prizes* (£1 each) to Maurice Bullock; Miss S. Page, Whitsley St. Giles, Torrington, Devon.
- Class 73**—BUTTER, free from Salt or slightly Salted, at the discretion of the Exhibitor, to be made from Scalded Cream only. 2 lbs. in 1-lb. lumps.—*First Prize* (£3) to Mrs. W. Irving. *Second Prize* (£2) to Mrs. Oxenham. *Third Prize* (£1) to Mrs. John Way.
- Class 74**—BUTTER, free from Salt. 2 lbs. in oblong pounds or bricks, shaped with Scotch hands, but without decoration or printing on top of pounds.—*First Prize* (£3) to Maurice Bullock. *Second Prize* (£2) to Mrs. L. R. Mildon. *Third Prize* (£1) to George Venning.

Class 75—BUTTER, free from Salt, in 24-lb. boxes of 12 rolls. Packages (non-returnable) to be taken into consideration. The Rolls not to be separately wrapped.—*First Prize* (£5) to Charleville Co-operative Creamery, Ltd., Charleville, Co. Cork. *Second Prize* (£3) to Springfield Co-operative Dairy Society, Enniskillen, Fermanagh. *Third Prize* (£2) to Granagh Co-operative Dairy Society, Ballingarry, Co. Limerick. *Fourth Prize* (£1) to Piltown Co-operative Dairy Society, Ltd., Piltown, Co. Kilkenny. *Fifth Prize* (10s.) to Charles Prideaux, The Grange, Motcombe, Dorset.

Class 76—MILD CURED BUTTER, in boxes of 24 rolls of 1 lb. each, slightly Salted. Packages (non-returnable) to be taken into consideration. Wrapping allowed.—*First Prize* (£5) to Ballymote Co-operative Agricultural and Dairy Society, Ltd., Ballymote, Co. Sligo. *Second Prize* (£3) to Charles Prideaux. *Third Prize* (£2) to A. R. Hoole, Pasford, Pattingham, near Wolverhampton.

Class 77—CURED BUTTER, not less than 28 lbs., slightly Salted. Packages (non-returnable) to be taken into consideration.—*First Prize* (£5) to Ballinlillick Co-operative Agricultural and Dairy Society, Cliffokey, Co. Sligo. *Second Prize* (£3) to Granagh Co-operative Dairy Society. *Third Prize* (£2) to Pomeroy Co-operative Dairy Society, Pomeroy, Co. Tyrone.

Class 78—CURED BUTTER, 56 lbs. Packages (non-returnable) to be taken into consideration.—*First Prize* (£5) to Belleek Co-operative Dairy Society, Belleek, Co. Fermanagh. *Second Prize* (£3) to Ballinlillick Co-operative Agricultural and Dairy Society. *Third Prize* (£2) to Charleville Co-operative Creamery, Ltd. *Fourth Prize* (£1) to Cavan Central Co-operative Agricultural and Dairy Society, Ballyhaise, Co. Cavan. *Fifth Prize* (10s.) to Pomeroy Co-operative Dairy Society.

Class 79—FANCY OR ORNAMENTAL DESIGN IN BUTTER, with foliage or other extraneous decoration.—*First Prize* (£3) to Miss H. M. Trenchard, Uphay Farm, Axminster, Devon. *Second Prize* (£2) to Mrs. J. Robson, West Farm, Ovington, Ovingham, Northumberland. *Third Prize* (£1) to Mrs. M. Evans, Litchborough, Weedon, Northants.

Class 80—FANCY OR ORNAMENTAL DESIGN IN BUTTER, without extraneous decoration, adapted for table use.—*First Prize* (£3) to Miss H. M. Trenchard. *Second Prize* (£2) to Mrs. J. Robson. *Third Prize* (£1) to Mrs. Hart, Bradley Hall Farm, Wyham-on-Tyne.

#### COLONIAL BUTTER.

(Open to Makers only.)

Class 81—SALTED BUTTER, one box containing not less than 56 lbs.—*First Prize* (Silver Medal and £5) to Taieri and Peninsula Milk Supply Co., Ltd., Dunedin, New Zealand. *Second Prize* (Bronze Medal and £3) to Dungog Co-operative Butter Factory, Ltd., Dungog. *Third Prize* (£2) to Warwick Butter and Dairying Co., Ltd., Warwick Factory, Queensland.

Class 82—UNSALTED BUTTER, one box containing not less than 56 lbs.—*First Prize* (Silver Medal and £5) equally divided to Taieri and Peninsula Milk Supply Co., Ltd., Dunedin, New Zealand; Taieri and Peninsula Milk Supply Co., Ltd., Oamaru, New Zealand. *Third Prize* (£2) to Downs Co-operative Dairy Co., Ltd., Mills, Queensland. *Fourth Prize* (£1) to Denman Co-operative Dairy Co., Ltd., Denman.

SPECIAL PRIZE GIVEN BY MESSRS. ELKINGTON & CO., LTD.

Awarded for the best Exhibit in Classes 67 to 74.—“Elkington” Cup (value £3 3s.) to Mrs. L. R. Mildon, Mead Down, Rackenford, North Devon. (Class 70, No. 1050.)

## CREAM.

Class 83.—CLOTTED CREAM, in vessels (filled) ready for sale.—*First Prize* (Silver Medal) to Mrs. L. R. Mildon, Mead Down, Rackenford, North Devon. *Second Prize* (Bronze Medal) to Charles Prideaux, The Grange, Motcombe, Dorset.

Class 84.—CREAM, OTHER THAN CLOTTED, in vessels (filled) ready for sale.—*First Prize* (Silver Medal) to S. F. Edge, Malt House Farm, Stratat, Plumpton. *Second Prize* (Bronze Medal) to Brooklands Dairy, 39, Elm Grove, Southsea.

## SKIM-MILK BREAD AND SCONES.

(Mixed with Skim Milk in lieu of Water.)

Class 85.—WHITE BREAD, 2 loaves, not exceeding 2 lbs. each.—*First Prize* (Silver Medal) to W. Jackson & Son, Ltd., Victoria Street, Hull. *Second Prize* (Bronze Medal) to W. D. Baldwin, Magnet Restaurant, Woodbridge.

Class 86.—BROWN BREAD, 2 loaves, not exceeding 2 lbs. each.—*First Prize* (Silver Medal) to Natural Food Co., Ltd., 305, Cambridge Road, Bethnal Green, London, E. *Second Prize* (Bronze Medal) to Natural Food Co., Ltd.

Class 87.—FANCY BREAD, not exceeding 4 lbs.—*First Prize* (Silver Medal) to W. D. Baldwin. *Second Prize* (Bronze Medal) to W. D. Baldwin.

Class 88.—HOME-MADE BREAD, 2 loaves, not exceeding 2 lbs. each. (Bakers or members of their families are not eligible to compete in this Class.)—*First Prize* (Silver Medal) to Mrs. S. A. Keirby, Hilly Laid Road, Thornton-le-Fylde. *Second Prize* (Bronze Medal) to Mrs. R. Avery, Hyde Farm, Luton.

Class 89.—TWELVE SCONES (baked on Girdle or Plate or in Oven, any shape, not exceeding 6 ozs. each, without fruit). *First Prize* (Silver Medal) to Lawrence Witt, 34, Heath Place, Twickenham. *Second Prize* (Bronze Medal) to S. Reece & Sons, Ltd., Hawke Street, Liverpool.

## HONEY, WAX, &amp;c.

Class 90.—TWELVE JARS OF LIGHT-COLOURED EXTRACTED HONEY, 1 lb. each approximate weight.—*First Prize* (£1) to William Abram, Moss Side, Banks, near Southport. *Second Prize* (15s.) to W. H. Allard, Poors Plot Farm, Stockton, Rugby. *Third Prize* (12s. 6d.) to W. Patchett, North Wold Apiary, Cabourne, near Caistor, Lincs. *Fourth Prize* (10s.) to E. C. R. White, Newton Tony, near Salisbury.

Class 91.—TWELVE JARS OF MEDIUM-COLOURED EXTRACTED HONEY (other than Heather Honey), 1 lb. each approximate weight.—*First Prize* (£1) to W. B. Allister, Throckenholt, Wisbech. *Second Prize* (15s.) to Sidney Sanderson, West Watting, Cambs. *Third Prize* (12s. 6d.) to C. E. Billson, Cranford, near Kettering. *Fourth Prize* (10s.) to E. C. R. White.

Class 92.—TWELVE JARS OF DARK-COLOURED EXTRACTED HONEY (including any variety of Heather Mixture), 1 lb. each approximate weight.—*First Prize* (15s.) to J. Pearman, Penny Long Lane, Derby. *Second Prize* (10s.) to Lady Gertrude Crawford, Coxhill, Lymington, Hants.

Class 93.—TWELVE JARS OF RUN (Ling, *Caluna vulgaris*) HEATHER HONEY, 1 lb. each approximate weight.—*First Prize* (15s.) to J. Pearman. *Second Prize* (10s.) to M. J. Lamboll, Chiddingfold, Surrey. *Third Prize* (7s. 6d.) to J. T. Duckmaston, Gate Hotel, Langwith, Mansfield.

Class 94.—TWELVE JARS OF GRANULATED HONEY OF 1912, or any previous year, 1 lb. each approximate weight.—*First Prize* (£1) to F. W. Frusher, Swiss Apiary, New Road, Crowland. *Second Prize* (10s.) to Richard Allen, Tusmore Park, Bicester. *Third Prize* (7s. 6d.) to J. Pearman.

Class 95.—TWELVE SECTIONS OF HONEY (other than Heather), size,  $4\frac{1}{2}$  by  $4\frac{1}{2}$ , 1 lb. each approximate weight.—*First Prize* (£1) to James Lee & Son, Ltd., George Street, Uxbridge. *Second Prize* (15s.) to J. Pearman. *Third Prize* (10s.) to C. W. Dyer, Compton, near Newbury.

- Class 96—SIX SECTIONS OF HEATHER HONEY, 1 lb. each approximate weight.—*First Prize* (£1) to J. M. Balmbra, East Parade, Alnwick. *Second Prize* (15s.) to Henry Waddington, Kirby Hill, Boroughbridge, Yorks. *Third Prize* (10s.) to C. Randolph Dudgeon, Cargen Holm, Dumfries.
- Class 97—DISPLAY OF COMB AND EXTRACTED HONEY OF ANY YEAR, approximately 100 lbs. in weight, shown on a space of 3 ft. by 3 ft.—*First Prize* (£2) to James Lee & Son, Ltd. *Second Prize* (£1 5s.) to J. Pearman.
- Class 98—WAX (not less than 2 lbs., in 2 cakes only, the produce of the Exhibitor's Apiary; extracted and cleaned by the Exhibitor or his assistants).—*First Prize* (15s.) to W. Patchett. *Second Prize* (10s.) to Miss K. E. Harwood, Old Sarum House, Stratford Road, Salisbury. *Third Prize* (7s. 6d.) to E. C. R. White.
- Class 99—WAX (not less than 3 lbs., the produce of the Exhibitor's Apiary, extracted and cleaned by the Exhibitor or his assistants. To be shown in shape, quality, and package suitable for the retail trade).—*First Prize* (15s.) to J. Pearman. *Second Prize* (10s.) to Albert MacCullagh, Webberton, Dunchideock, near Exeter. *Third Prize* (7s. 6d.) to G. W. Goodburn, Church Street, Oakham, Rutland.
- Class 100—INTERESTING AND INSTRUCTIVE EXHIBIT OF A PRACTICAL OR SCIENTIFIC NATURE, connected with Bee Culture, not mentioned in the foregoing Classes.—(No Award.)

#### ROOTS, &c.

Information must be given on the Entry Form as to the soil in which the Roots, &c., are grown; also the name of seed and manurial treatment. All Mangolds and Swedes must bear at least 3 inches of leaf, and be washed but not trimmed, oiled, or otherwise treated.

- Class 101—SIX SPECIMENS OF LONG MANGOLDS, drawn from a crop of not less than 2 acres.—*First Prize* (£3) to Lady Wantage, Lockinge House, Wantage. *Second Prize* (£2) to R. R. Isaac, Turgis, Basingstoke. *Third Prize* (£1) to Abraham Gregory, Saughton, Chester.
- Class 102—SIX SPECIMENS OF GLOBE MANGOLDS, drawn from a crop of not less than 2 acres.—*First Prize* (£3) to Mrs. Ashley, Prospect Grange, Irlam, Manchester. *Second Prize* (£2) to G. W. Layley, Hillfoot Farm, Beenham, Reading. *Third Prize* (£1) to F. Horne, Salter's Hall, Boblington.
- Class 103—SIX SPECIMENS OF GOLDEN OR CRIMSON TANKARD MANGOLDS, drawn from a crop of not less than 2 acres.—*First Prize* (£3) to R. R. Isaac. *Second Prize* (£2) to Chas. Tough, Bell Farm, Etonwick, Windsor. *Third Prize* (£1) to John Perry, The Grange, Oswaldkirk, Malton, Yorks.
- Class 104—SIX SPECIMENS OF INTERMEDIATE MANGOLDS, drawn from a crop of not less than 2 acres.—*First Prize* (£3) to William Everall, Forton, Salop. *Second Prize* (£2) to John Perry. *Third Prize* (£1) to L. J. Smith, The Scari, Newent, Glos.
- Class 105—SIX SPECIMENS OF SWEDE (Purple or Bronze Top), any variety, drawn on a crop of not less than 2 acres.—*First Prize* (£3) and *Second Prize* (£2) usually divided between Mrs. Ashley and Thomas Simpson, Bucklow Farm, Mbley, Knutsford. *Third Prize* (£1) to W. Atkinson, Overthwaite, Miln-c.
- Class 106—SIX SPECIMENS OF SWEDE (Green Top), drawn from a crop of not less than 2 acres.—*First Prize* (£3) to Mrs. Ashley. *Second Prize* (£2) to Thomas Simpson. *Third Prize* (£1) to J. C. Caldwell, Knockshoggle-by-Tarbolton, Ayr.
- Class 107—COLLECTION OF ROOTS, &c., for Cattle Feeding in Winter (consisting of Six Specimens of as many as possible of the following: Mangolds, Sugar mangolds, Swedes, Turnips, White Carrots, Red Carrots, Potatoes, Beetroot, Kale, Kohl-rabi, Parsnips, and Cabbage).—*First Prize* (£5) to Mrs. C. McIntosh, Havering Park, Romford. *Second Prize* (£3) to Lady Wantage. *Third Prize* (£2) to G. W. Layley.

## INVENTIONS &amp;c.

Class 108.—ANY NEW INVENTION relating to the Dairy Industry, or one showing distinct and practical improvement, not eligible for competition in any other Class, and not previously exhibited in competition at the Dairy Show.—*Silver Medal* to Eduard Ahlborn, Hildesheim, Germany, for Self-Elevating Horizontal Pasteurizer. *Bronze Medal* to Eduard Ahlborn for Combined Hygienic Cream or Milk Ripening and Cooling Vat with agitator that may be elevated and used as a Refrigerator; to Eduard Ahlborn for Rotary Butterworker; to Blackstone & Co., Ltd., Stamford, for 5 H.P. Vertical Portable Engine with New Patent Governor; to Dairy Outfit Co., Ltd., King's Cross, London, N., for "Insula" Portable Cold Chamber to contain one churn of milk; to Watson, Laidlaw & Co., Ltd., 98, Dundas Street (South), Glasgow, for 330-gallon Rope-Driven "Princess" Cream Separator; to Frank Bryan & Co., 122, Newgate Street, London, E.C., for Improved Centrifugal Machine for Testing Milk and Cream in Large Dairies and Creameries, with New Sloping Crank and Free-Wheel Action; and to Omega Milking Machine Co., Flen, Sweden, for Milking Machine.

Class 109.—RECEPTACLES OF METAL OR OTHER MATERIAL, glass excepted, for the delivery of milk in small quantities to private customers, in sizes to hold quarts, pints, and half-pints.—Section A.—Returnable Receptacles (3 sizes).—*Silver Medal* to Dairy Supply Co., Ltd., 28, Museum Street, London, W.C. *Bronze Medal* to Vipan & Headley, Leicester.

Class 109—Section B.—Non-returnable Receptacles (3 sizes).—*Bronze Medal* to Dairy Supply Co., Ltd.

## BUTTER-MAKING CONTESTS.

Class 110—Section A (open to those who have never won a prize at any show wherever held).—*First Prize* (£3) to John Grove, Carharthen, Probus, Cornwall. *Second Prize* (£2) to Miss Bessie Higgins, Munster Institute, Cork. *Third Prize* (£1) to Miss Mary Kane, Munster Institute, Cork.

Class 110—Section B.—*First Prize* (£3) to Miss Bessie Herring, Shenmore Court, Madley, Herefordshire. *Second Prize* (£2) to Miss Daisy Larkin, Munster Institute, Cork. *Third Prize* (£1) to Miss Ada Roberts, Dyffryn, Meifod, Welshpool.

Class 111—Open to Students who attended Classes at the British Dairy Institute, Reading, for not less than one month during the past two years.—*First Prize* (£3) to Miss H. M. Williams, Castleton, St. Athan, near Cardiff. *Second Prize* (£2) to Miss M. C. Knight, 65, Wimborne Road, Bournemouth. *Third Prize* (£1) to W. V. Twose, Westgate, London Road, Reading.

Class 112—Section A (open to Men and Women).—*First Prize* (£3) to Miss E. J. Hockley, Cooper's Farm, Takeley, S.O., Essex. *Second Prize* (£2) to Miss Alice Munslow, Harnage Grange, Cressage, Salop. *Third Prize* (£1) to Miss Annie Bland, Holster Farm, via Mellor Brook, Blackburn.

Class 112—Section B.—*First Prize* (£3) to Miss H. M. Williams. *Second Prize* (£2) to Miss P. Uglow, Tobarn, Jacobstow, Bude. *Third Prize* (£1) to Miss I. L. Bull, Hursley Park Dairy, near Winchester.

Class 112—Section C.—*First Prize* (£3) to Miss Bessie Higgins. *Second Prize* (£2) to Miss Gwen B. Tuckett, Penquite, Par, Cornwall. *Third Prize* (£1) to Miss Christine Webb, The Home Farm, Savernake Forest, Marlborough.

Class 112—Section D.—*First Prize* (£3) to Miss Daisy Larkin. *Second Prize* (£2) to A. J. Mildon, Mead Down, Rackenford, North Devon. *Third Prize* (£1) to Mrs. Edward Watts, Ty Uchaf, Llantrithyd, Cowbridge, R.S.O.

Class 112—Section E.—*First Prize* (£3) to Miss E. F. Goodwin, Brickyard Farm, Bradley, near Stafford. *Second Prize* (£2) to Miss Mary Kane. *Third Prize* (£1) to Miss P. A. John, Llandinam Hall, Llandinam, Mon.

Class 113—Open to First Prize Dairy Show Winners of 1913.—*First Prize* (£3) to Miss E. F. Goodwin. *Second Prize* (£2) to Miss H. M. Williams. *Third Prize* (£1) to Miss Bessie Higgins.

Class 114—Champion Contest (open to Winners of First Prizes in the preceding Classes, or at the Dairy Show, 1912. Champions of any year excepted).—*First Prize* (Lord Mayor's Champion Cup, value £10 10s., and £5) to Miss E. J. Hockley. *Second Prize* (£3) to Mrs. N. Comer, Jenningsbury, Hertford. *Third Prize* (£2) to Miss H. M. Williams.

Class 115—Open to Members of the Dairy Students' Union. *First Prize* (the "Hackett" Silver Challenge Cup and Silver Medal) to Miss E. J. Hockley. *Second Prize* (£1) to Mrs. M. Wallace, Whitehorse Dairy, Whitehorse Lane, South Norwood, S.E. *Third Prize* (10s. 6d.) to Miss Janet James, Blaen Baglan Dairy, Aberavon.

#### MILKERS' CONTESTS.

Class 116—Open to Men over 18.—*First Prize* (£5) to George B. Nelson, Junr., Cockerham Hall, Garstang. *Second Prize* (£3) to James Kendal, 4, Thomson Road, Seaforth, Liverpool. *Third Prize* (£2) to W. Hansford, Froglands Farm, Carisbrooke, Isle of Wight. Three *Equal Fourth Prizes* (£1 each) to Richard Fowler, Summerhill Farm, Droitwich; William Herd, 36, Greta Street, Liverpool; J. Moffat, Watercrook, Kendal.

Class 117—Open to Boys under 18.—*First Prize* (£5) to Ernest Lovel, Oak Hill Farm, East Barnet. *Second Prize* (£3) to T. L. Masson, Attimore Hall, Hatfield, Herts. Two *Equal Third Prizes* (£2 each) to Fred Jackson, Causey Hill Farm, Hexham; George Green, The Bank, Pool Quay, Welshpool. *Fifth Prize* (£1) to Robert Brown, Hedges Farm, St. Albans.

Class 118—Open to Women over 18.—*First Prize* (£5) to Miss E. J. Hart, Bradley Hall Farm, Wylam-on-Tyne. *Second Prize* (£3) to Miss D. M. Masson, Attimore Hall, Hatfield, Herts. Two *Equal Third Prizes* (£2 each) to Miss G. M. Grocott, Haughton, Tarporley; Miss Nellie Ward, Chorlton Old Hall, Malpas, Cheshire. Three *Equal Fifth Prizes* (£1 each) to Miss Jenny Rosser, Chapel Farm, Ross, Herefordshire; Miss J. R. G. Masson, Attimore Hall, Hatfield, Herts; Miss Mary Masson, Attimore Hall, Hatfield, Herts.

Class 119—Open to Girls under 18.—*First Prize* (£5) to Miss E. Morrison, Manor Farm, Cliffe-at-Hoo, near Rochester. *Second Prize* (£3) to Miss Nancy Jones, The New House, Staunton-on-Wye. *Third Prize* (£2) to Miss Lizzie Bowen, Nantfforch, Llanfair, Mon. Four *Equal Fourth Prizes* (£1 each) to Miss C. Butler, Holme Farm, Rabley Park, Barnet; Miss M. H. Jones, Haston Grove, Hadnall, Shrewsbury; Miss Lily Hallett, Home Farm, Dinder, Wells; Miss Mary Green, The Bank, Pool Quay, Welshpool.

Class 120—Champion Contest (open to First Prize Winners in preceding Classes or at the Dairy Shows of 1911 and 1912; Champions of any year excepted).—*Gold Medal* and £5 to Miss E. J. Hart, Bradley Hall Farm, Wylam-on-Tyne.

SPECIAL PRIZE.—A case of Silver Tea Spoons, offered by Miss Ethel Everest to the Best Competitor in Class 118, being a Farmer's Wife or Daughter, providing sufficient proficiency is shown.—Awarded to Miss E. J. Hart, Bradley Hall Farm, Wylam-on-Tyne.

SPECIAL PRIZE.—A Writing Desk, offered by Miss Ethel Everest to the Best Competitor in Class 119 who is regularly engaged at Milking.—Awarded to Miss E. Morrison, Manor Farm, Cliffe-at-Hoo, near Rochester.



## HALF-YEARLY REPORT OF THE COUNCIL TO THE MEMBERS, PRESENTED TO THE MEETING HELD AT THE DAIRY SHOW, OCTOBER 22nd, 1913.

In welcoming the Members to the 38th Half-yearly Meeting, the Council are gratified to be able to report continued progress in the Association's undertakings. There are now 1,120 Annual Members on the register, compared with 1,025 at the date of the Annual Meeting held on April 2nd. Life Members total 81, and another kindred society has become affiliated, making eight such societies, which between them represent a total of about 5,000 persons who benefit by the work of the Association.

A very successful conference and tour was carried out in Ireland in June, a large number of members participating. A hearty reception was extended to the party from all directions, and generosity of a princely character was forthcoming to aid its progress, for which the Council are exceedingly grateful. In accordance with the wishes expressed during that tour, voting papers were issued to members to vote for a tour in 1914 in either Canada, Germany, Italy, or Devonshire. The majority of the votes received were in favour of Devonshire, and the Council propose to organise a tour accordingly in that county and district, several letters of welcome also having been received from various public bodies with offers of assistance in drafting a programme.

The Medal Distribution Scheme which was inaugurated in January for County Shows and Educational Authorities, the conditions of which were included in the last Annual Report, has brought 59 applications for Silver medals and 11 for Bronze Medals; and to date 51 Silver and 8 Bronze Medals have been awarded. It is hoped that this method of distribution will encourage the promotion of dairy farming, and give wider publicity to the Association than has hitherto been possible.

The Council have been honoured by Sir Gilbert Greenall, Bart., whose interest in the Association is well known, in allowing his name to be submitted as its nomination for President in 1914, and your vote in support is desired by the Council.

A list of Vice-Presidents has also been prepared and will be placed before you for approval.

In response to the views expressed at the last Dairy Show that the Council Members should be elected under a different mode than formerly, and that Candidates be more representative of the County Districts, the Council appointed a Committee, who considered the matter. The Committee's recommendations were carried out in the election to fill the twelve vacancies occurring on the Council this year. The following twelve Members retire in accordance with the Rules, viz.:

Messrs. J. Sadler, W. Ashcroft, S. R. Whitley, W. S. Brocklehurst, J. C. Robinson, J. A. Smith, E. G. F. Walker, J. Righby, L. M. Douglas, G. E. Lloyd-Baker, Capt. R. Oliver Bellasis, and Prof. T. Carroll.

All the above have been nominated for re-election by Members outside those on the Council, with the exception of Mr. G. E. Lloyd-Baker (who does not seek re-election), in addition to the following new nominations for election, viz. :—

Mr. E. H. Clarke, Cossington, Leicester, and Mr. W. H. Edwards, Pinhoe, Devon.

The result of the election will be declared at a later stage of this Meeting.

The Dairy Show now proceeding, the thirty-eighth of its series, promises to be again a success. All available space for stands was applied for and allotted some weeks ago. The competitive entries for the past six years are given below :—

	1907.	1908.	1909.	1910.	1911.	1912.	1913.
Cattle ... ..	237	247	232	288	222	210	286
Milking and Butter Tests ...	245	224	236	264	213	209	265
Goats ... ..	48	72	84	75	81	105	110
Poultry ... ..	3,081	3,280	2,997	3,259	3,300	3,350	3,840
Pigeons ... ..	2,664	2,764	2,282	2,280	2,226	2,496	2,467
Poultry and Pigeon Appliances	65	50	37	—	—	—	—
Cheese ... ..	420	357	355	362	249	343	395
Bacon and Hams ... ..	57	76	55	104	58	71	89
Butter ... ..	593	668	535	525	484	618	549
Cream ... ..	35	47	42	47	26	48	43
Skim-Milk Bread, &c....	118	135	115	98	72	83	64
Honey, &c. ... ..	67	85	88	96	87	95	106
New and Improved Inventions	33	37	31	34	21	25	41
Roots ... ..	177	181	218	196	172	190	190
Butter-making, Contests	200	207	120	145	165	165	141
Milkers' Contests ... ..	135	132	126	122	153	119	137
	8,175	8,362	7,553	7,895	7,520	8,127	8,723

From the above table it will be gathered that entries are well above the average, and the Council trust that the quality of the exhibits will merit the approval of the public and a renewal of the patronage of those interested in the Dairying industry.

A subject which has engaged the attention of the Council during the past few months is the new railway rates for conveyance of dairy produce and milk, and a motion appears on the Agenda of the Meeting which will afford an opportunity for discussion among the members for the guidance of the Council.

Members are requested to note that after December 25th next the Society's Offices will be removed to more palatial premises on the first floor of 28, Russell Square, London, W.C'.

By order of the Council,

FREDERICK E. HARDCASTLE,

*Secretary.*

# THIRTY-EIGHTH

## ANNUAL REPORT OF THE COUNCIL

to the General Meeting of Members.

Wednesday, April 1st, 1914.

SATISFACTORY progress has been made by the Association during the past year in promoting the Dairying and Dairy Farming Industry of the United Kingdom, and the Council are gratified in being able to report that against 1,079 Annual Members on the Register at the corresponding date last year, there are now 1,133. Life Members number 77. Total 1,210 compared with 1,161. Twelve Kindred Societies are now affiliated as under:—

Berks and Adjoining Counties Dairy Farmers' Association.

British Bee Keepers' Association.

Blackpool and District Dairy Farmers and Milk Producers' Association.

Cambs and Isle of Ely Agricultural Society.

Dairy Education Committee.

Essex Agricultural Society.

Lancashire Farmers' Association.

Metropolitan Dairymen's Society.

Northumberland and Durham Dairy Farmers and Milk Producers' Association.

Oxfordshire Agricultural Society.

South Australian Bee Keepers' Union, Ltd.

Staffordshire Agricultural Society.

It is to be regretted that Individual Membership is not greater considering the importance of the work in which the Association is engaged; and it behoves all Members to endeavour to interest others who are engaged in the industry and secure their support, thereby adding influence and power to the Association in the difficult problems which it has from time to time to face on their behalf. It is a pleasing feature, however, that Kindred Societies are realising the

importance of being affiliated, which entitles their Delegates to a seat on the Council.

The constitution of the Council has changed since the last Report was issued, in that Mr. E. H. Clarke and Mr. W. H. Edwards have been elected in the places of Mr. G. E. Lloyd Baker and Prof. Carroll, who retired at the Annual Dairy Show in accordance with the Rules. The Council lament the decease of two greatly esteemed Vice-Presidents: Lord Tredegar of Newport, Mon., a brave soldier and keen Agriculturist, and Sir George Barham, J.P., of Wadhurst, Sussex, and a tribute to the last-named gentleman will be found on pages 9 to 14 of this Journal. In consequence of that great loss a vacancy was created in the Trusteeship, and to fill same Sir Gilbert Greenall, Bart. (President), was elected. The Council are satisfied the appointment will be popular with the members.

From the Report of the Auditors attached hereto it will be noticed that the financial aspect has considerably improved. The excess of expenditure over income on the General Account is slightly more than that of last year (notwithstanding the fact that Members' Subscriptions amounted to £34 more, and to less expenditure by £25 on account of the British Dairy Institute, Reading, in the management of which the Council continue to be associated with the authorities of the University College, Reading), owing to increased clerical staff and Medal Scheme. The cash balance at the end of the year was the largest in the annals of the Association and amounted to £1,178 18s. 1d. eclipsing that of 1912 by £167 7s. 1d. It will also be noticed that further investments have been made in Stocks on behalf of the Association, and it is contemplated to increase the total amount by about £1,225 in the near future. Very little need be added to what has already appeared in the Agricultural Press as to the Dairy Show held on October last, which resulted from economy in expenditure combined with its increasing popularity with exhibitors and public.

While dealing with the finances the Council desire to record their hearty thanks to the following Members who so kindly subscribed to the Association's funds in addition to their Annual Subscriptions, and the Council trust that these may become more numerous as time progresses and thus enable them to increase the impetus already given for offering additional prizes at the Dairy Show:—

	£	s.	d.
Captain R. W. Ethelston, Prize Fund ...	27	0	0
Samuel Sanday, Prize Fund ...	5	0	0
British Bee Keepers' Association, Prize Fund ...	5	0	0
Dairy Education Committee, Prize Fund ...	1	10	6

In addition to the above, Miss Ethel Everest, of Chippens Bank. Hever, kindly offered a writing case and case of silver spoons as prizes.

A hearty welcome was accorded to the Dairy Conference Party which visited Ireland in the spring, and the Report of the proceedings will be found on pages 50 to 62. The Council take this opportunity of recording a hearty appreciation and thanks to the Members of the Government Department, Noblemen, Gentlemen, and Institutions who so kindly provided hospitality and afforded facilities which resulted in what may be described as a most successful Tour and Conference. In accordance with the votes of Members, the next Conference and Tour will take place in Devonshire, where great enthusiasm is being shown in drafting a programme commencing on May 16th and ending on May 23rd. An official programme stating cost will shortly be issued to Members.

Three Examinations for the Association's Diplomas and Certificates were held, two at the British Dairy Institute, Reading, and one at Chelmsford: the latter at the request of the Essex County Education Committee. The following awards resulted: three Diplomas for the Proficiency in Science and Practice of Dairy Farming and Dairying; four Teachers' Certificates for Proficiency in the Science and Practice of Dairying; nine Certificates of Merit in the Theory and Practice of Cheesemaking; thirty-three Certificates of Merit in the Theory and Practice of Buttermaking.

Following the announcement in the last Annual Report that a Medal Distribution Scheme had been formulated whereby it was proposed to award Silver and Bronze Medals to Educational Centres and Approved Societies under certain conditions during the year, 73 applications were considered, and 53 Silver Medals and eight Bronze Medals were granted for the following subjects, viz:—

	Silver.	Bronze.
Dairy Cattle ... ..	22	2
Butter or Cream ... ..	16	1
Cheese ... ..	3	1
Buttermaking ... ..	6	1
Examinations ... ..	6	3
Total ... ..	53	8

Eleven applications were refused owing to non-compliance with the conditions of the Scheme, or the subject for which the Medal was required not being considered of sufficient merit for support to be given. Notwithstanding the expenditure entailed by the Scheme, the good it does in promoting the production of high quality articles is considered ample compensation, and the Council have decided to continue with the Scheme for the year 1914.

The Council in March last had under consideration the Milk and Dairies Bill presented by Mr. John Burns and Mr. Herbert Lewis, dated

December 10th, 1912, and a number of suggested modifications of the Measure were agreed upon and ordered to be forwarded to Mr. Burns, with a request that he receive a deputation from the Association. This he agreed to do: with the result that the deputation attended and so adequately pleaded their recommendations for alterations in the Bill that the Measure was eventually dropped. A Committee has now been formed and is considering the whole question of Milk Regulations with a view to making suggestions which may be helpful in drafting a new Bill which would be acceptable to the country. Mr. Runciman was asked to receive a deputation from the Association on the matter of the Tuberculosis Order, and did so; but the deputation was unable to alter his decisions on many important points, and the result of the working of the Order which eventually came into force is, from the Dairy Farmers' point of view, not satisfactory.

The Council have also watched with great concern the enormous growth in the manufacture and sale of margarine and other butter substitutes which have become such a serious menace to the prosperity of Dairy Farmers throughout the British Empire. Representatives were appointed to attend on behalf of the Association the various deputations and Conferences that were arranged to consider this matter, but the ultimate results are not yet to hand.

Arising out of recommendations of the Members at the Half-Yearly Meeting held during the last Dairy Show with regard to the Increased Rates charged by Railway Companies for the transit of Milk, the Committee which was appointed as a result thereof have met, and with 42 Delegates from Kindred Societies have carefully considered the matter and passed the following Resolutions, viz.:-

1. "That this Meeting is emphatically of opinion that the recent increases in Railway Rates for the transit of Milk are unjustifiable as well as detrimental to the interests of the Community, and that steps be taken forthwith to call upon the Railway Companies to justify such increases before the Railway and Canal Commissioners."
2. "That considering the importance of cheap distribution of Milk to the Agricultural interests and to the health of children in large cities, the Railway Companies be requested to receive a deputation upon the subject at an early date, not later than the 20th February, in view of the approaching renewal of milk contracts."

In support of carrying into effect the above Resolutions, the Council have voted a sufficient sum for the preliminary expenses which may be incurred, and in the event of it being found necessary to appeal to the Farmers of the country for further funds, it is sincerely hoped such an appeal will meet with a favourable response. The Resolutions were duly forwarded to the Board of Trade and the Railway Clearing House,

with the result that the Railway Companies have sent the following reply :—

Seymour Street,  
Euston Square,  
London, N.W.

The Secretary,  
British Dairy Farmers' Association,  
28, Russell Square,  
London, W.C.

Dear Sir,

Your letter of the 5th instant with copy of Resolution enclosed was placed before a Meeting of the General Managers of the Railway Companies held here recently, and I was desired to reply as follows :—An increase in the charge for the conveyance of Milk by rail was rendered necessary by the largely increased working expenses which Railways in common with other industries throughout the country have been called upon to meet. But the Companies have been convinced by representations made to them that calculations based upon fractions of a penny being charged as a penny may operate somewhat hardly in certain cases, and in the hope of meeting this criticism they propose, as from the 1st of March next, to introduce modified charges in accordance with the enclosed scale of rates. The reasonableness or otherwise of the increased charges must, if necessary, be tested as provided by the Statutes, but I am to inform you that the Companies feel that either of the new scales could be abundantly justified, and to point out to you that the charges are substantially below those authorised by Statutes, that Milk Traffic requires many special services, and that these and other factors must be taken into consideration, quite apart from the heavy new burdens the Railway Companies admittedly have to bear to which the Act of 1913 relates.

Yours truly,

(Signed) H. CUFF SMART.

The Scale referred to removed in some measure the grievances in the most important case of a fraction, but the 4 per cent. still remains, and it was decided to proceed in the appeal in respect of the unwarrantable increases that have been made since July 1st, 1913, and with a view to a reduction or abolition of the 4 per cent. increase in the future.

The Association have put their offices and their Secretary at the disposal of the British Section representing the International Dairy



Federation in this Country, and an Executive Committee has been formed consisting of six Members of the Council and six Members of the Association not on the Council. Mr. F. J. Lloyd, F.I.C., F.C.S., Consulting Chemist to the Association, has been elected Delegate to the permanent Bureau. The Council draw the attention of the Members to the fact that in order to protect ourselves we must know what is being done in other countries. We must keep in touch with the thoughts, science and practice of those countries. We must be prepared not only to do what is best for ourselves, but to convince others that what we do is right and gives us a just claim to protest against unfair competition. The first requisite, then, in order that this country may take its proper place in these International Congresses, is a large British Section, with the sinews of war provided by annual subscriptions. Without this we cannot hope to do more than take an inadequate place among the Nations and people interested in Dairying. The Council appeal to all Members for their own sakes to join the British Section—subscription 5s. only—and thus help to protect the Dairy Industry of this country, to take an active interest in these International Congresses, form a strong national Section—a well-organized body of representatives present at the Congress—to meet on the spot to consider any resolutions, and decide how to act as a body, so as to make the weight of British views felt.

In conformity with the growing importance of the Association and the magnitude of its undertakings, the Council have found it necessary to move to more convenient and well situated Offices at 28, Russell Square, London, W.C., where Members can, during Office Hours—10 a.m. to 5 p.m.—arrange to meet friends. There is a small library of books on Dairying matters, and meetings to accommodate 60 to 80 persons can be arranged at a moderate fee, particulars obtainable from the Secretary, the same to include the use of room, light, fire, &c.

By order of the Council,

FREDERICK E. HARDCASTLE,

*Secretary.*

# British Dairy Farmers' Association.

## FINANCIAL STATEMENTS.

Gr. GENERAL INCOME AND EXPENDITURE ACCOUNT for the Year ended December 31st, 1913. Cr.

EXPENDITURE.			INCOME.			Annual Report of Council.		
1912.	£	s. d.	1912.	£	s. d.	1912.	£	s. d.
	116	18 6		899	3 3		933	18 4
	309	9 4		1	10 6		0	13 6
	54	13 6		24	7 6		24	0 6
	250	0 0		75	12 4		59	16 6
	112	11 1		74	8 0		97	7 2
	198	3 6		252	17 1		6	0 0
	29	13 5					262	16 0
	35	1 0						
	31	10 0						
	24	3 0						
	3	17 5						
	0	15 0						
	81	2 11						

**Dr. DAIRY SHOW INCOME AND EXPENDITURE ACCOUNT for the Year ended December 31st, 1913. Cr.**

1912.			EXPENDITURE.			1912.			INCOME.		
£	s.	d.				£	s.	d.	£	s.	d.
73	9	6	Entry Fees returned ...		...	47	9	6	Entry Fees, Competitive and Non-Competitive ...		...
2,951	10	3	Prizes to Exhibitors ...		...	3,240	2	3	Catalogue Sales and Advertisements ...		...
770	6	9	Sales of Exhibits ...		...	877	14	1	Admission Money ...		...
265	14	6	Wages : Clerks and Assistants ...		...	346	16	1	Sales of Exhibits ...		...
139	17	1	Do. Labourers ...		...	156	8	10	Sales in Working Dairies, &c. ...		...
164	17	1	Printing and Stationery ...		...	191	10	5	Contributions to Prize Fund ...		...
358	11	6	Advertising ...		...	386	0	0	Miscellaneous—Protest Fees ...		...
445	0	0	Rent of Royal Agricultural Hall ...		...	400	0	0			...
584	3	4	Fittings, &c. ...		...	420	18	5			...
80	19	1	Forage (Hay, Straw, &c.) ...		...	89	5	5			...
99	15	0	Band ...		...	97	10	0			...
492	2	0	Judges and Stewards' Fees ...		...	476	13	0			...
186	6	1	Refreshments ...		...	185	19	8			...
88	10	8	Postage ...		...	100	19	6			...
184	1	0	Working Dairies, Milk, Cream, Ice, &c. ...		...	192	14	10			...
186	14	8	Light, Water, &c. ...		...	197	12	3			...
237	3	0	Catalogue ...		...	273	19	6			...
80	2	1	Police ...		...	79	12	4			...
33	7	6	Turnstiles ...		...	33	0	0			...
38	0	0	Steam ...		...	38	0	0			...
43	15	0	Signs, Headboards, &c. ...		...	47	18	8			...
23	1	0	Decorations ...		...	53	1	0			...
9	0	0	Clearing Hall ...		...	9	0	0			...
28	15	0	Analyses ...		...	37	10	0			...
14	14	2	Law Charges ...		...	26	0	8			...
			Miscellaneous Expenses : Insurance, Auctioneer, Badges, Rosettes, Lodgings, Baskets, Boxes, Bankers' Charges, and Sundries ...		...	219	18	4			...
207	12	3									
684	1	2	BALANCE, being Excess of Income over Expenditure ...		...	1,213	14	7			
£8,471	10	3				£9,369	9	4			
						£8,471	10	3			
						£9,369	9	4			



# THE British Dairy Farmers' Association.

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## THE OBJECTS OF THE ASSOCIATION

are the improvement of

### DAIRY STOCK AND DAIRY PRODUCE,

by encouraging the Breeding and Rearing of Stock for the special purpose of the Dairy; a larger and more general production of Butter, Cheese, and Eggs; the Erection of Improved Dairy Buildings, and the Invention of New or Improved Dairy Utensils, Machinery, Implements, and Scientific Appliances. The Association also stimulates the Breeding and Rearing of Poultry, &c. By means of Papers in the Society's *Journal* (published annually), Annual Conferences in different dairy districts, Lectures, and Discussions, and in other ways, efforts are continually being made to disseminate a more thorough knowledge of Dairy husbandry.

Prizes to the value of about £3,500 are annually offered for competition at the Dairy Show held at the Royal Agricultural Hall, Islington, London.

It is difficult to over-estimate the importance and need of greater attention being paid to the Dairy industry. It is admitted that by improved modes of managing Milk and its products, the wealth obtained from the Milch Cows of the country could be increased most materially. The Council, therefore, appeal to Agriculturists of all classes, and Dairy Farmers in particular, who, by becoming Members of the Association, will practically aid in developing its usefulness.

### The advantages of Membership comprise:—

- 1.—A free pass to all the Society's Dairy Shows, available each day during the Exhibition, with the privilege of admitting free (by ticket) a friend on any one day.
- 2.—The privilege of participating at specially low charges in the Dairy Conferences at home or abroad, organised by the Association.
- 3.—The Exhibition of Live Stock, Dairy Produce, and Utensils, at a reduced scale of fees.
- 4.—A copy (free by post) of the *Journal* of the Association, published annually; price 1s. to non-members.
- 5.—Analyses by the Analytical and Consulting Chemist, at low fees, of samples of milk, cream, butter, cheese, feeding stuffs, water, soil, manures, &c.; and advice on dairy matters connected with his Department.

- 6.—Professional advice and assistance at a reduced scale of charges, in any case of disease among the live stock of the farm.
- 7.—Examinations of plants and seeds by the Consulting Botanist on specially low terms.
- 8.—Examinations by the Consulting Pathological Bacteriologist, for particular pathogenic or disease-producing organisms.
- 9.—Investigations by the Consulting Dairy Bacteriologist into the cause of trouble or taints in dairy produce.
- 10.—In any case of apparent hardship in connection with the administration of the Model Milk Clauses, Members are recommended to at once send details of such case to the Secretary, who will submit the matter to the Committee appointed to deal with such matters, after which, advice and assistance will be given by the Association.

The Annual Subscription is £1, but Dairy Instructors and *bonâ fide* Tenant Farmers are admitted on payment of 10s. 6d. per annum. The latter sum entitles Dairy Instructors to all privileges, except the reduced fees for exhibition at the Shows. A *bonâ fide* Tenant Farmer is deemed to be one who rents the whole of the land in his occupation.

#### MEMBERS' VETERINARY PRIVILEGES.

Members of the Association who require professional assistance in any case of disease among their animals must apply direct to the Consulting Veterinary Surgeon, Mr. SIDNEY VILLAR, F.R.C.V.S., Amersham (Common, Bucks, whose scale of charge is as follows:—

	£	s.	d.
Personal Consultation ... ..	0	10	6
Post-mortem Examination and Report ... ..	0	10	6
Consultation by Letter ... ..	0	5	0
Visit and Report, in case of an outbreak of disease, in addition to personal and travelling expenses, per day ... ..	2	2	0

#### MEMBERS' BOTANICAL PRIVILEGES.

The Council have fixed the following rates of charge for the examination of Plants and Seeds for the *bonâ fide* and individual use and information of Members of the Association (not being Seedsmen), who are particularly requested, when applying to the Consulting Botanist, to mention the kind of examination they require, and to quote its number in the subjoined Schedule.

No.	£	s.	d.
1.—A Report on the purity, and amount of nature of foreign materials, of a sample of seed ... ..	0	1	0
2.—A Report on the perfectness and germinating power of a sample of seed Nos. 1 and 2 together ... ..	0	1	6
3.—Determination of the species of any weed or other plant, or of any epiphyte or vegetable parasite, with a report on its habits, and the means for its extermination or prevention ... ..	0	1	0
4.—Report on any disease affecting farm crops ... ..	0	1	0
5.—Determination of the species of a collection of natural grasses found in any district, with a report on their habits and pasture value ..	0	4	0

*Instructions for Selecting and Sending Samples.*

The utmost care must be taken to secure a fair honest sample. When possible, at least one ounce of grass and other small seeds should be sent, and two ounces of cereals or larger seeds. Grass seeds should be sent at least four weeks, and clover seeds two weeks before they are to be used. In collecting specimens of plants, the whole plant should be taken up, and the earth shaken from the roots. If possible, the plant must be in flower or fruit. They should be packed in a light box, or in a firm paper parcel. Specimens of diseased plants or parasites should be forwarded as fresh as possible—either in a bottle or packed in tinfoil or oil silk. All specimens should be accompanied with a letter specifying the nature of the information required, and stating any local circumstance (soil, situation, &c.) which, in the opinion of the sender, would be likely to throw light on the inquiry. Parcels or letters containing seeds or plants for examination must be addressed to the Consulting Botanist, Professor JOHN PERCIVAL, M.A. University College, Reading.

The charge for examination must be paid, in Postage Stamps or otherwise, at the time of application, and the carriage of all parcels must be prepaid. It must be distinctly understood that *no notice can be taken* of any application unless it is accompanied by the proper fee.

## MEMBERS' CHEMICAL PRIVILEGES.

MILK (Fresh).	£	s.	d.
Estimation of Fat and Total Solids ... ..	0	2	6
Estimation of Fat, Casein, Albumin, Sugar, and Ash ... ..	0	10	6
MILK (Sour).			
Estimation of Fat and Total Solids ... ..	0	5	0
SKIMMED MILK.			
Estimation of Fat and Total Solids ... ..	0	5	0
CONDENSED MILK.			
Estimation of Fat ... ..	0	5	0
Estimation of Fat, Casein, and Solids .. ..	0	10	6
Estimation of Cane Sugar ... ..	0	5	0
HUMANISED MILK.			
Complete Analysis ... ..	1	1	0
CREAM.			
Estimation of Fat ... ..	0	5	0
Estimation of Fat, Casein, and Solids .. ..	0	10	6
Examination for Foreign Fats ... ..	0	10	6
BUTTER.			
Estimation of Water, Casein, and Ash ... ..	0	5	0
Examination for Foreign Fats .. ..	0	10	6

							£	s.	d.
<b>CHEESE.</b>									
Estimation of Water, Fat, and Casein	...	...	...	...	...	...	0	5	0
Examination for Foreign Fats	...	...	...	...	...	...	0	10	6
<b>RENNET.</b>									
Examination of Strength	...	...	...	...	...	...	0	5	0
<b>CAKES AND MEALS</b>									
Estimation of Oil only	...	...	...	...	...	...	0	5	0
Estimation of Oil, Albuminoids, and Carbo-hydrates	...	...	...	...	...	...	0	10	6
<b>GRASS, SILAGE, ROOTS, &amp;c.</b>									
Estimation of Oil, Albuminoids, and Carbo-hydrates, &c.	...	...	...	...	...	...	1	1	0
<b>MANURES.</b>									
Estimation of Phosphoric Acid	...	...	...	...	...	...	0	5	0
Estimation of Soluble and Insoluble Phosphoric Acid	...	...	...	...	...	...	0	7	6
Estimation of Nitrogen...	...	...	...	...	...	...	0	5	0
Estimation of Potash	...	...	...	...	...	...	0	5	0
<b>SOIL.</b>									
Estimation of Lime	...	...	...	...	...	...	0	5	0
Analysis and Report	...	...	...	...	...	...	2	2	0
<b>WATER.</b>									
Analysis for Drinking or Dairy Purposes	...	...	...	...	...	...	1	1	0
<b>POISONS.</b>									
Examination of a Substance for Mineral Poisons	...	...	...	...	...	...	2	2	0
Examination for Organic Poisons (Alkaloids, &c.)	...	...	...	...	...	...	3	3	0
<b>CIDER AND FERMENTED DRINKS.</b>									
Estimation of Alcohol	...	...	...	...	...	...	0	5	0
Estimation of Alcohol, Sugar, Acidity, &c.	...	...	...	...	...	...	0	10	6
<b>PRESERVATIVES.</b>									
Examining a Substance for Boracic Acid or Salicylic Acid, &c., for each Substance sought...	...	...	...	...	...	...	0	2	6
Estimation of the quantity of Boracic Acid	...	...	...	...	...	...	0	10	6
Analysis of a Preservative	...	...	...	...	...	...	1	1	0
<b>COLOURING MATTER.</b>									
Examination for Artificial Colouring	...	...	...	...	...	...	0	5	0
<b>CONSULTATION.</b>									
For Letter in reply to Enquiry	...	...	...	...	...	...	0	5	0
For Personal Interview	...	...	...	...	...	...	0	5	0
For Special Consultation	...	...	...	...	...	...	1	1	0
<b>NOTE.</b> —The Consulting Chemist will be prepared to quote reduced terms to members requiring a number of analyses at frequent intervals.									

*Instructions for Taking Fair Samples for Analysis.*

**Dairy Produce.**—Milk should be sent in a well-corked 8-oz. clear bottle. The milk should quite fill the bottle. Butter or cheese, about 8 ounces; the former in a gallipot well tied down.

**Soils.**—A block of soil about four or five inches square, and nine inches deep, should be sent in a strong box by rail.



**Artificial Manures.**—Take a handful of manure out of at least half a dozen bags, mix these rapidly and thoroughly, breaking down all lumps. Forward about a pound of the mixture in a tin box, and retain the remainder. Samples of manure should be sent immediately after the delivery of the bulk, and before settling the account. All manures should be bought subject to analysis.

**Feeding Materials.**—Feeding cakes, meals, or grains: about a pound should be sent in a bag or box. Grass and hay: a bundle of a few pounds weight. Silage: a six-inch cubic block, packed closely in a box to keep it compressed.

**Waters.**—A Winchester quart glass-stoppered bottle should be procured from a druggist, well washed out with the water, then completely filled, the stopper tied securely down, and the bottle packed in a box and sent by rail.

N.B.—In order to prevent disappointment, the Chemist requests that, as far as possible, Members desiring to hold a personal consultation should make an appointment by letter. Between 12 and 3 are the hours most convenient. The fees for analyses of artificial manures and feeding stuffs are payable in advance, and only applicable to Members who are not commercially engaged in the manufacture or sale of the articles sent for analysis. All communications intended for the Analytical and Consulting Chemist must be addressed direct to Mr. F. J. LLOYD, F.C.S., 3, New Street, Bishopsgate, London, E.C.

#### MEMBERS' BACTERIOLOGICAL PRIVILEGES.

EXAMINATIONS BY Dr. ANDREWES, Pathological Laboratory,  
St. Bartholomew's Hospital, London, E.C.

##### MILK. £ s. d.

Cultural and experimental examination for a particular pathogenic organism	...	...	...	...	...	...	...	...	...	2	2	0
--	-----	-----	-----	-----	-----	-----	-----	-----	-----	---	---	---

##### PASTEURISED OR STERILISED MILK.

Cultural and experimental examination for a particular pathogenic organism	...	...	...	...	...	...	...	...	...	1	1	0
--	-----	-----	-----	-----	-----	-----	-----	-----	-----	---	---	---

##### CREAM, BUTTER, OR CHEESE.

Cultural and experimental examination for a particular pathogenic organism	...	...	...	...	...	...	...	...	...	2	2	0
--	-----	-----	-----	-----	-----	-----	-----	-----	-----	---	---	---

##### WATER.

Cultural and experimental examination for a particular pathogenic organism	...	...	...	...	...	...	...	...	...	2	2	0
--	-----	-----	-----	-----	-----	-----	-----	-----	-----	---	---	---

INVESTIGATIONS BY MR. F. J. LLOYD, F.C.S., 3, New Street,  
Bishopsgate, London, E.C., INTO THE CAUSES OF TROUBLE  
OR TAINTS IN MILK, CREAM, BUTTER, OR CHEESE.

MILK.						£	s.	d.
Microscopical and cultural examination for a particular organism ...	2	2	0					
Experimental and cultural examination for a particular organism						£5	5	0 to 10 10 0
CREAM, BUTTER, CHEESE.								
Microscopical examination ... ..	0	10	6					
Microscopical and cultural examination...	2	2	0					
PASTEURISED OR STERILISED MILK.								
Microscopical examination for bacteria ... ..	0	5	0					
Estimating number of bacteria present ... ..	0	10	6					
Culture examination of bacteria present .. ..	2	2	0					

*Directions for Sending Samples.*

Samples of milk or water (one quart) and cream (half pint) should be forwarded in wide-mouthed stoppered bottles which have previously been thoroughly cleaned, and then rinsed several times with very hot, almost boiling, water.

*Butter* is best sent in a  $\frac{1}{2}$ -lb. brick or roll, just as it was made up, wrapped in grease-proof paper, and packed in a box.

If the *Cheese* is small, send a whole one; otherwise forward a square block of not less than one pound and not a wedge-shaped piece. Wrap in grease-proof paper and pack in a box.

All samples should be sent by the speediest method possible. They ought not to arrive either on Saturday or Sunday.

Samples to be examined for disease-producing organisms should be forwarded to Dr. Andrewes, Pathological Laboratory, St. Bartholomew's Hospital, London, E.C. Members are requested to note that in the case of examination for the tubercle bacillus the method of animal inoculation, which experience has shown to be the only reliable one, will be alone used. It is impossible to carry out the process of sedimentation necessary for the detection of tubercle bacillus in milk which is received in a curdled condition. The report cannot be sent for a period of four to six weeks from the time the sample is received, but in the case of other pathogenic organisms the time required is much shorter. Samples to be examined for organisms producing taints in dairy produce should be forwarded to Mr. F. J. LLOYD, F.C.S., 3, New Street, Bishopsgate, London, E.C.

## THE BRITISH DAIRY INSTITUTE, READING.

The British Dairy Institute was established at Aylesbury in 1888, by the British Dairy Farmers' Association, and several hundred Students were successfully trained there in different branches of dairy work. In order that Students might have an opportunity of combining with the practical study of dairying a more complete scientific instruction, the Institute was, in 1896, moved to Reading, and placed under the management of a Committee representing the British Dairy Farmers' Association and the University College, Reading.

The Institute contains large milk-receiving, butter-making, and milk-testing rooms; rooms for the manufacture of pressed, unpressed, and soft cheeses; and rooms for the ripening and drying of different varieties of cheese; besides reading, lecture, and common rooms. It is equipped with the best modern apparatus for the manufacture of dairy produce.

The instruction given is both practical and theoretical, and is arranged to suit the requirements of those who need either elementary or advanced dairy instruction, or who wish to perfect themselves in the manufacture of any special variety of dairy produce, including power-driven separating, pasteurizing, and butter-making plant, a steam turbine separator, and cold storage plant.

The Institute is open throughout the year, except during the Winter Vacation of eight weeks, which commences about the middle of November.

Students may join at any time and for any period.

The manufacture of hard-pressed cheeses extends from March to the end of September, but Stilton and other blue-veined varieties are not made until May.

Soft cheese making is taught during the whole of the time when the Institute is open.

During the winter months (October and November and January to March) instruction is given in butter-making, clotted-cream making, the testing and analysis of milk, bacteriology, the management of various types of separators, the handling and care of milk, and the preparation of starters, &c. Lectures and demonstrations are usually given in the afternoons, the mornings being chiefly devoted to practical dairy work.

Practical and theoretical instruction in butter-making and cheese-making (including hard-pressed, blue-veined, and soft cheese), £1 per week; £10 for three months; £18 for six months.

Practical and theoretical instruction in butter-making only, 10s. per week.

A full Prospectus will be sent on application to the Secretary, British Dairy Institute, Reading.

NOTE.—Entry Forms may be obtained from the Secretary of the British Dairy Farmers' Association, 28, Russell Square, London, W.C., or from the Registrar of the College, Reading.

# The British Dairy Farmers' Association.

## LIST OF MEMBERS, MARCH, 1914.

- ABBOT, Richard (Abbot Bros.), Thuxton, Norfolk  
 Abbot, Thomas, Wymondham, Norfolk  
 Abbott, Edward (Abbott Bros.), Gun Lane, Limehouse, London, E.  
 Abbott, Harold Ray, Grange Hill, Chigwell, Essex  
 Abhatt, Philip E. (representing Abbott, Field, & Co., Ltd.), 7, Oakley Street  
 Waterloo, London, S.E.  
 Adams, John, Broomhurst Farm, Fleet, Hants; and 7, Moreton Street, Pimlico  
 London, S.W.  
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 Ahlborn, Otto C., Hildesheim, Germany  
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 Alexander, Reuben C. Lawrence, Model Farm Dairy, Tidey Street, Devons Road,  
 Bromley-by-Bow, London, E.  
 Alexandra Separator Co. (represented by Harold V. Hunt), 9-11, Eagle Street  
 London, W.C.  
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 Alexander, W. J., Sele Farm, Hertford  
 Allen, Captain Ralph Rowland, Sawbridgeworth, Hertfordshire  
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 Aplin, James Shorland (representing Aplin & Barrett), Yeovil, Somerset  
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 Arkwright, William, Sutton Scarsdale, Chesterfield, Derby  
 Arnold, Edwin Ross, The Cottage, Maidenhead, Berks  
 Ashby, Joshua J., Brixton Flour Mills, Brixton, London, S.W.  
 Ashby, Skidmore, Rivernook Farm, Wraybury, Bucks  
 Ashcroft, W., 13, The Waldrons, Croydon, Surrey  
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 Astor, Waldorf, M.P., Cliveden, Taplow, Bucks  
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 Atkinson, R. C., Spilsteds Farm, Sedlescombe, Battle, Sussex  
 Attwater, J. A., Dry Leaze, Cirencester, Glos  
 Austin, Robert, Inglestone, Twynholm  
 Avis, A. A., Stoke Farm, Stoke Bardolph, Nottingham (L.M.)  
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 Baily, J., & Son, 116, Mount Street, W., and Heathfield, Mayfield, Sussex  
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 Baker, Benjamin Richard, 31, Barford Street, Islington, London, N.

- Baker, Granville, Hardwicke, Gloucester (L.M.)  
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 Banwell, J. W., Home Farm, East Harptree, near Bristol, Glos  
 Banyard, Richard, Nelmes Farm, Romford, Essex  
 Barbour, G., J.P., Bolesworth Castle, Chester  
 Barclay, Edward Exton, Brent Pelham Hall, Buntingford, Herts  
 Barham, Arthur S., Hole Park, Rolvenden, Kent  
 Barham, G. Titus, Sudbury Park Farm, Sudbury, Harrow, Middlesex (L.M.)  
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 Barr, Peter, Marston Park Farm, Ampthill  
 Barry, Major S., D.S.O., Pitsford Hall, Northampton  
 Barrymore, Lord, Fota, County Cork  
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 Bates, Oswald F., Harlow Court, Harrogate, Yorks  
 Bates, Tom C., Sudbury Dairy Co., Sudbury, Derby  
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 Bedford, Geo. Smith, County Education Office, Gloucester  
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 Bellasis, Capt. R. Oliver, Shilton House, Coventry, Warwickshire  
 Belper, Lord, Kingston Hall, near Derby  
 Bennett, Alfred, Cote Farm, Aust. Tockington, Glos  
 Benson, John, The Kettering Dairy, Dalkeith Place, Kettering, Northampton  
 Benson, Miles, British Dairy Institute, Reading, Berks  
 Bentall, E. E., Heybridge, Maldon, Surrey  
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 Berry, Grosvenor, Bromley Hall, Standon, Herts  
 Bertodano, Baldomero de, Cowbridge House, Malmesbury, Wilts  
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 Betts, Walter, Moreton, Thame, Oxon  
 Bewes, Charles, Gnaton Hall, Yealmpton, Devon  
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 Birch, Alfred, Edge Farm, Sefton, via Seaforth, Liverpool  
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 Birmingham, Warwickshire  
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 Blackburn, George John, Oarside Dairy Farm, Liscard, Cheshire  
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 Briggs, Harold S., Elliston, St. Boswells, N.B.  
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 Britten, R. Spencer, Holloway House, Beaconsfield, Bucks  
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 Brocq, Ph. le, La Chasse, St. Ouen's, Jersey  
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 Brodie, W. A. G., Crichton Asylum, Dumfries (L.M.)  
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 Burfitt, Joseph, Goodedge Farm, North Bruham, Bruton, Somerset  
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 Buxton, Walter, Trinity Poultry Farm, Medstead, Alton, Hants  
 Bygott, William B., Rye Hill House, Wing, Oakham, Rutland

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 Chant, C., Well Farm, Alford, Castle Cary, Somerset  
 Cheeld, Sydney, Chesham, Bucks  
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 125, Lower Baggot Street, Dublin  
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 Hursley Park Estate Office, Hursley, Winchester, Hants)  
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 Douglas, Thomas, Douglas Wharf, Putney, London, S.W.  
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 Emerton, H. J., Woodlands, Chase Side, Winchmore Hill, N.  
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 Enock, Arthur Guy, Thane Works, Fountayne Road, Broad Lane, South Tottenham  
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 Evans, James, Claremont Farm, Irlams-o'-th'-Height, Pendleton, Manchester, Lancs  
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 Evans, Miss J. T., Cidgill, Blaenysfoss, S.O., Pembrokeshire  
 Evans, Richard H., Madryn Castle Farm School, Pwllheli, Carnarvonshire  
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 Everett, Norman, Rushmere, near Ipswich, Suffolk  
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 Fawkes, F. H., Farnley Hall, Otley, Yorks.  
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 Ford, Walter C., 11, Carlisle Road, Eastbourne, Sussex  
 Fordham, A. R., Melbourne Bury, Royston, Herts  
 Forester, Capt. F., M.F.H., Saxelbye Park, Melton Mowbray  
 Formby, Wm., The Cedars, Stratton St. Michael, Long Stratton, Norfolk  
 Forster, Miss Jane, Dairy Institute, Worleston, Nantwich, Cheshire

Fortescue, Earl, Castle Hill, North Devon (L.M.)  
 Fortune, Robert, Newhouse, Cranleigh, Surrey  
 Four Oaks Spraying Machine Co. (represented by W. C. G. Ludford), Four Oaks, Sutton Coldfield, Birmingham, Warwickshire  
 Fowler, W. Herbert, J. P., Claremont, Taunton, Somerset (L.M.)  
 Fowler and De la Perrelle (represented by T. W. Brider), Porters Lane, near Royal Pier, Southampton, Hants  
 Fox, Robert, Grove Hill, Falmouth, Cornwall (L.M.)  
 Francis, Thomas, 34, High Street, Tunbridge Wells  
 Franklin, Joseph, Scottsgrove House, Thame, Oxon (L.M.)  
 Freckleton, F. S., Narborough Wood, Enderby, Leicester  
 Freeth & Pocock (represented by Sir Sidney J. Pocock, J.P.), Albert Embankment, London, S.W.  
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 Fremlin, Walter T., Milgate Park, Maidstone, Kent  
 French, James Thomas, Crystal Palace Dairy, Norwood, S.E.  
 Friend, George D. T., Perryland, Bentley, Hants  
 Frith, Mrs. John, The Portells, Lowesby, Leicester  
 Frost, Albert, Fox Farm, Sanderstead, South Croydon, Surrey  
 Frowd, Herbert H., 16, Seaside, Eastbourne, Sussex  
 Fuller, Sir J. M. F., Bart., J.P., M.P., Jaggards, Corsham, Wilts. (All communications to H. G. White)  
 Fuller, Robert F., Great Chalfield, Melksham, Wilts (L.M.)  
 Fullwood & Bland (represented by Charles Bland), 31, Beviden Street, Hoxton, N.  
 Furse, Miss Annie, Locks Farm, Hurstpierpoint, Sussex

GAMAGE, A. W. (represented by John S. Parker), Horticultural Dept., Holborn, E.C  
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 Garne, W. T., Aldsworth, near Northleach, Glos (L.M.)  
 Garrad, George H., Wye College, Kent  
 Garrard, F. R., The Hall, Framlingham, Suffolk (L.M.)  
 Gates, B. F. J., Wing Park, Wing, Bucks  
 Gatty, Albert A., Bannister Hall, near Preston, Lancs  
 Gibson, A., Yarrow, Haywards Heath, Sussex  
 Gibson, T., 213, New North Road, Hoxton, N.  
 Gilbert, Arthur C., The Swanley Poultry Farm, Swanley, Kent  
 Gilbert, F. W., The Lawn, Chellaston, Derby  
 Gilbey, Sir Walter, Bart., Elsenham Hall, Bishop Stortford, Essex  
 Gilderson, Robert, jun., Coach Works, High Road, Ilford, Essex  
 Giles, Henry, Stockers Farm, Rickmansworth, Herts  
 Gillies, John, 3, Lovers' Walk, Dumfries, Scotland  
 Gilmore, W. P., Balmangan, Kirkcudbright, N.B.  
 Gittins, William H., The Hall Farm, Ruyton-of-the-Eleven Towns, Shropshire  
 Gloucester Incubator Company (represented by E. L. Godfrey), Severn Works, Gloucester  
 Glover, Wilfred, The Retreat, Willoughby, Waterleys, near Leicester  
 Glynn, Sir Richard G., Bart., Gaunts House, Wimborne, Dorset  
 Godfrey, J. N., Sharpenhoe, near Ampthill, Beds  
 Godman, Lieut.-Col. A. F., East House, Great Smeaton, Northallerton, Yorks  
 Goff, J., Hale Farm, Edgware, Middlesex  
 Golding, John, F.I.C., F.C.S., University College, Reading, Berks  
 Golding, W. J., Westwood Farm, Weald, Kent  
 Goldsmith, Leslie, Bradley, Northgate Avenue, Bury St. Edmunds  
 Golland, Tom J., Carr Side, Appleby, nr. Doncaster, Yorks  
 Goodburne, Henry Walmsley, Manor House, Althorpe, Doncaster, Yorks  
 Goode, C. N., The Haydens, Bletsoe, Bedford  
 Goodwin, Thomas C., Henhull Hall, Nantwich, Cheshire  
 Goodwin, Dr. William, M.Sc., Ph.D., Midland Agricultural and Dairy College, Kingston, Derby

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 Gornall, Joseph, Claylands, Cabus, Garstang, Lancs  
 Gouldbourn, Edwd., Wilksley, Whitchurch, Salop  
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 Graham, George, The Moat, Much Hadham, Herts  
 Graham, Marchioness of, Easton Park, Wickham Market, Suffolk  
 Graham, Wm., Eden Grove, Kirkbythore, Penrith, Cumberland (L.M.)  
 Graham, Wm., The Willows, Marlesford, Wickham Market, Suffolk  
 Grant, Reginald, Springfield, Haverfordwest, Pembrokeshire  
 Grant, W. J., Pentonville, Newport, Mon.  
 Gray, George E., 99, Clova Road, Forest Gate, Essex, E. (L.M.)  
 Gray, Robert, Estate Office, Sherborne Park, Northleach, R.S.O., Glos  
 Grayson, Thomas, 16 and 17, Queen Street, Derby  
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 Green, George, Twyford, Melton Mowbray, Leicestershire  
 Green, J. L., *Rural World*, 110-111, Strand, London, W.C.  
 Green, Wm. Henry, Kersal Hall, Higher Broughton, Manchester, Lancs  
 Greenall, Lady, Walton Hall, Warrington, Lancs  
 Greenall, Sir Gilbert, Bart., C.V.O., Walton Hall, Warrington, Lancs. (Agent, W. Bainbridge, Estate Office)  
 Greenwood, Capt. Charles S., Swarcliffe, Birstwith, Leeds, Yorks  
 Greenwood, T. F., Salisbury Hall, Chingford Road, Chingford, Essex  
 Greetham, John, Goxhill, near Hull, Lincoln  
 Gregory, Abraham, Heath Croft Farm, Saughton, Chester, Cheshire  
 Griffin, J. Whitehouse, Towersey Manor, Thame, Oxon (L.M.)  
 Griffiths, Henry, 65, Eardley Crescent, Earls Court, London, S.W.  
 Grimsdale & Sons, Ltd. (D. Herbert Grimsdale), Maritime Buildings, 54, Great Tower Street, London, E.C.  
 Grimsdell, Henry John, 36, Snow Hill, London, E.C.  
 Grocott, E. A., Haughton, Tarporley, Cheshire  
 Gush, Geo. E., Thackham, Winchfield, Hants

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 Hambleden, Viscount, Greenlands, Henley-on-Thames. (Agent, W. F. Holt Beever, Estate Offices, Yewden, Henley)  
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 Harewood, Lord, Harewood House, Leeds, Yorks  
 Harker, Wm., jun., Blofield Hall, Norwich, Norfolk  
 Harper, Jos., Surndon Lodge, Kirkby Overblow, Leeds, Yorks  
 Harris, J. Wm. B., Court House Farm, Cam, Glos.  
 Harris, Stanley, Aspley Guise, R.S.O., Bedford (L.M.)  
 Harrison, Miss A. M., Oakwood, Mouldsworth, nr. Chester, Cheshire  
 Harrison, R. C. H., Shiplake Court, Henley-on-Thames, Oxon

- Harrison, Thomas D., Albion Iron Works, Leigh, Lancs  
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 Hartley, Arthur, Trentham House, Emsworth, Hants  
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 Hatt, John Daniel, Elsfield, Oxford  
 Hattersley, I. A., 31, St. Petersburg Place, Bayswater, London, W.  
 Hawes, Thomas, Bent Hill Farm, near Buckingham  
 Hawkins, A. W. Bailey, Stagenhoe Park, Welwyn, Herts  
 Haworth, Gordon M., Bush-on-Lyne, Longtown, Cumberland  
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 Haynes, Harry, North Lodge Farm, Enfield, Middx.  
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 Hayward, Colonel J. F. Curtis, Quedgeley, Gloucester (L.M.)  
 Hearn, John H., Churchtown, Sydenham Damarel, Devon  
 Hearnshaw, R. Fletcher, Foxhill, Burton Joyce, Nottingham (L.M.)  
 Heath, Robert, Woodhouse Farm, Biddulph, Congleton  
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 Heaver, John W. T., Rathain House, Chichester, Sussex  
 Hebditch, Harry, Poultry Farmer and Appliance Maker, Martock, Som.  
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 Henry, Sir Charles S., Bart., M.P., Parkwood, Henley-on-Thames, Oxon  
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 Higgon, Victor J., Sealyham, Wolfscastle, Pembrokeshire  
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 Hobbs, Robert W., Kelmscott, Lechlade, Gloucester  
 Hobson, W. H. Gonsley, Blakenhall, Nantwich, Cheshire  
 Hobson, J. W., New Wharf, St. Mary's, Bedford  
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 Holland, Mrs. L. H., Warton Grange, Newport, Salop  
 Hollington, Alfred Jordan, Forty Hill, Enfield, Middx.  
 Hollins, William, Pleasley Vale, Mansfield, Notts  
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 Howard, Robert, Pound Farm, Esher, Surrey  
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 Hughes, Herbert E., The Bungalow, Broxbourne, Herts  
 Hughes, Jas. W., Church Farm, South Hinckley, near Oxford  
 Humphreys-Owen, A. C., J.P., Glansevern, Berriew, R.S.O., Mon.  
 Hunt, W. W., Park Farm, Grundesburgh, Woodbridge, Suffolk  
 Hunter, Miss Mary F., Albany, Ballybrack, Co. Dublin  
 Hunter, Tom, Dolphinlee Farm, Lancaster  
 Hurran, Rowland, 31, Bevenden Street, Hoxton, N.  
 Hussey, Charles, 23, High Street, Croydon, Surrey  
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 Jardine, Ernest, M.P., Clumber Crescent South, The Park, Nottingham  
 Jay, Edwin B., J.P., Holmesdale House, Epsom, Surrey  
 Jay, James A., Galley Lane Farm, Barnet, Herts  
 Jay, Wm. James P., Kirkstead Hall, Finchfield, Braintree, Essex  
 Jeffery, A., 70, High Street, Walthamstow, Essex  
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 Jenkinson, J. H. Dixon, Church Lane, Handsworth, Birmingham, Warwickshire  
 Jenkins, Arthur, Coledown, Botley, Hants  
 Jervoise, A. T. E., The Grange, Herriard, Basingstoke, Hants (L.M.)  
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 Johnson, John Henry, Tolmers Park, Hertford  
 Johnston, William Hunter, 17, Cumberland Park, Acton, W.  
 Johnstone, Miss M., Field Head, Outgate, Ambleside, Westmorland  
 Jones, Alfred, Quarry Farm, Godstone, Surrey  
 Jones, A. E., University College of Wales, Aberystwyth, Cardigan  
 Jones, Miss Mary, New House, Staunton-on-Wye, Hereford  
 Jones, Miss J. I. C., Eisteddfa, Criccieth, N. Wales  
 Jones, Richard, Brumby Hall Farm, Scunthorpe, Lincolnshire  
 Jones, Selwyn, Carthage-Foy, Ross, Hereford  
 Joyce, Geoffrey, Blackfordby, near Burton-on-Trent, Stafford  
 Jukes, Wm. A., Charteridge, Chesham, Bucks

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- Keeble, J. R., Brantham Hall, Manningtree  
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 Kelly, J. M., Dedswell Manor, West Clandon, Guildford  
 Kelly, T. W., Ridgeway Street, Douglas, Isle of Man  
 Kelsal, William, Bettisfield Hall, Whitchurch, Salop  
 Kendall, Mrs. William, Millow Hall Farm, Biggleswade, Beds  
 Kennedy, Robert, 346, Pollockshaw Road, Glasgow  
 Kennedy, Mrs. Watson, Wiveton Hall, Cley, Norfolk  
 Kenyon, Lord, Gredington, Whitchurch, Salop  
 Keyser, Charles E., J.P., Aldermaston Court, near Reading, Berks  
 Khan, Sahabzada Mahmood A., Zafarmanzil, Rampur State, India  
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 Knight, John, 108, Whitehorse Street, Stepney, London, E.  
 Knoop, Jersey de, J.P., Calveley Hall, Tarporley, Cheshire  
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 Knowles, Miss Margaret, Chipping Dairy, Longridge, Preston
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 Lakin-Smith, W. Hawkes, 184, Hagley Road, Edgbaston, Warwickshire  
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 Lambert, Thomas, Hadlow, Kent  
 Lambert, Lionel F., Hewell Estate Office, Redditch, Worcs  
 Lambton, Colonel The Hon. Charles, D.S.O., Naval and Military Club, 94, Piccadilly, London, W.  
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 Lee, John, Trimpley House, Ellesmere, Salop  
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 Le Feuvre, Francis V., La Fosse, St. Peter's, Jersey  
 Le Feuvre, Philip, Morville House, St. Ouen's, Jersey  
 Leigh, Miss Mary Blanche, Woodchester Park, Stonehouse, Glos  
 Lennard, Sir Henry F., Bart., Wickham Court, West Wickham, Kent  
 Leon, Sir Herbert S., Bletchley Park, Bucks  
 Leppard, F., Sussex Dairy, College Park, Lewisham, S.E.  
 Levy, Sir Maurice, Bart., M.P., Humberstone Hall, Leicester  
 Lewis, Gerald W., The Creamery, Farwich, Ashbourne, Derby  
 Lilley, Joseph E., The Chestnuts, Wealdstone, Harrow, Middlesex (L.M.)  
 Lilly, C. E., Brown's Dairy, 176, High Street, Camden Town, N.W.  
 Linlithgow, Marquis of, Hopetoun House, South Queensferry, Scotland

Lister, Sir Robt. Ashton, Dursley, Gloucester  
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 Little, Geo., Northumberland Street, Huddersfield, Yorks  
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 Long, Robert, Upper Standon, Shefford, Beds  
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 Lord, Jas. W., Church House, Northiam, Sussex  
 Lousley, Job, Green Farm, Burghfield, Berks  
 Lovell, Ernest John, 12, West Smithfield, London, E.C.  
 Lovell, John Cary, 12, West Smithfield, London, E.C.  
 Low, William, 34, Hilldrop Crescent, Camden Road, London, N  
 Lowish, William W., Barnetby, via Lincoln  
 Lowndes, Wm., The Bury, Chesham, Bucks (L.M.)  
 Loyd, E. Henry, Langleybury, King's Langley, Herts  
 Lucas, Lord, Wrest Park, Ampthill, Beds (Agent: Cecil T. Argles, Estate Office)  
 Lucas, John, Hoards Park Farm, Bridgnorth, Salop  
 Ludden, J. B., Cyphers Incubator Co., 119-125, Finsbury Pavement, London, E.C.  
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 Lye, Ernest Blundell, Leagrave Hall, Luton, Beds  
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 Lyon, James, Creamery, Ballyrashane, Coleraine, Co. Antrim  
 Lyon, James, Wilderness Farm, Guildford, Surrey

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 MacGibbon, William, Burnside, Rolleston-on-Dove, Burton-on-Trent, Staffs  
 Machin, Henry Vessey, J.P., Gateford Hill, near Worksop, Notts  
 Mackenzie, Kenneth J. J., University of Cambridge, Cambridge  
 Mackintosh, James, University College, Reading, Berks  
 MacNicoll, D., F.S.I., Derwas, Abergele, Denbigh  
 Macqueen, Miss M. M., Hutton, Preston, Lancs  
 Maden, John H., Rockcliffe House, Bacup, Lancs  
 McConnell, Primrose, Northwyke, Southminster, Essex  
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 McIntosh, Mrs. Charlotte, Havering Park, Romford, Essex. (T. A. Beckett, Agent.)  
 McKerrow, Miss A. D., Stoneleigh, Garforth, Yorks  
 McMyn, I. G., Kirkhouse, Kirkbean, Dumfries  
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 Mallinson, Richard, Reddon Court Farm, Harold Wood, Essex  
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 Manger, R. H., Beech Farm, Camberley, Surrey  
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 Marlborough, Duke of, Blenheim Palace, Oxfordshire (L.M.). (Agent, R. L. Angas, Estate Office.)  
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 Marshall, James, 12, Regent Quay, Aberdeen



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 Martineau, Mrs. Jennie St. George, Holly Bank, Coleshill, nr. Birmingham, Warwickshire  
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 Mason, Miss Jean, The Moothall, Newcastle-on-Tyne, Northumberland  
 Mason, Miss Madeline, County Dairy School, The Castle, Exeter  
 Masson, Miss Emmy, The Dairy Cottage, Floors Castle, Kelso, Roxburghshire  
 Masson, John, Attimore Hall Farm, Hatfield, Herts  
 Mathews, Ernest, Little Shardeloes, Amersham, Bucks  
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 Matthews, Miss Anne, County Laboratories, Chelmsford, Essex  
 Matthews, James, Kingston Fields, Derby  
 Matthews, Leonard, Old House, Milton, Gillingham, Dorset  
 Matthews, Mrs., Haighton Hall, Bangor-on-Dee, Wrexham  
 Mauzer, William, Les Rosiers, St. Peter Port, Guernsey  
 Maughan, A. S., Pontac, Marske-by-the-Sea, Yorks  
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 Meech, Randolph, Poole, Dorset  
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 Methuen, General Lord, Corsham Court, Wiltshire  
 Meyer, Fred., Kingsthorpe, Northampton  
 Middleton, Barham, Collickmoor Farm, Coldharbour, Dorking, Surrey  
 Middleton, Christopher, Vane Terrace, Darlington, Durham  
 Middleton, H. W., Raleigh Farm Dairy, 3, Palace Parade, Enfield, Middlesex  
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 Street, London, N.  
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 Mildmay, Francis B., M.P., Flete, Ivybridge, S. Devon  
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 Miller, Thomas B., Manor House, Cricklade, Wilts  
 Miller-Hallett, Alexander, Goddington, Chelsfield, Kent  
 Miln, George P., Milnholme, Chester, Cheshire  
 Milne, James, Rock Ferry, Cheshire  
 Mitchell, Walter, & Sons (represented by Andrew Mitchell), Ayr  
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 Molassine Co., Ltd. (represented by S. W. Goodman), Greenwich, London, S.E.  
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 Monsell, Mrs. Eyres, Dumbleton Hall, near Evesham, Worcs  
 Montefiore, Mrs., Worth Park, Crawley, Sussex (Agent, C. Allen, Estate Office)  
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\*Representing British Dairy Farmers' Association.  
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## SIR GILBERT GREENALL, BART., C.V.O., PRESIDENT, 1914.

IN writing of Sir Gilbert Greenall as a breeder of livestock, it is impossible to confine oneself to a particular section, as his interest has extended over the whole of the animals of the farm, viz.:—horses, cattle, sheep, and pigs.

With regard to dairy cattle, Sir Gilbert's earliest venture at Walton Hall was a herd of Jerseys, which was kept and exhibited successfully for several years until its disposal in 1896. Subsequently a herd of Kerries, established by Lady Greenall, made its mark in the show ring, and when it was dispersed last year the sale was a record one.

Sir Gilbert interested himself in the Dairy Shorthorn at the time of the sale of the late Mr. George Taylor in 1912, when he bought several animals, the most important of which was "Waterloo Baroness," for which 500 guineas was paid. This was the commencement of the Dairy Shorthorn herd which is now kept at Sir Gilbert's Mount Coote Estate in Ireland.

As will be readily understood, his aim is to produce the highest-class animal of the breed he takes up.

In the horse-breeding world his name will always be remembered in connection with the Hackney and the Hackney Pony, and in fact with light horses generally, including the Hunter, with which he has had so much experience and such considerable success.

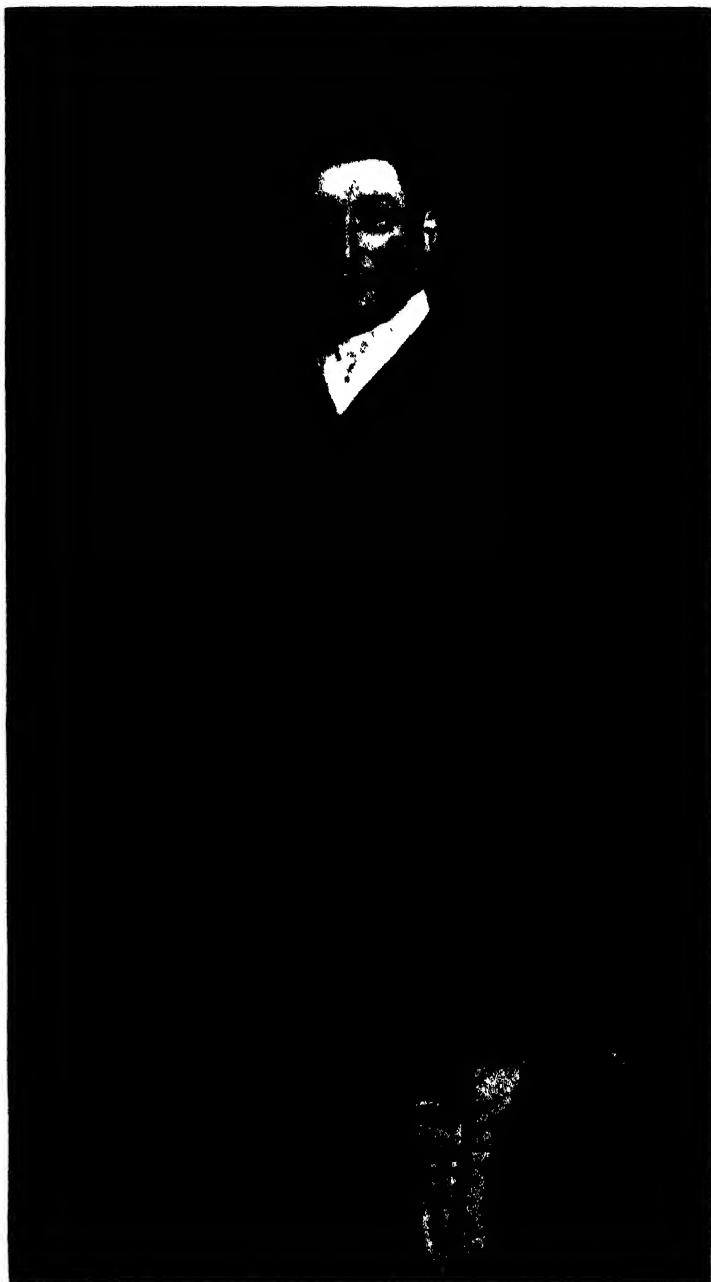
As a breeder of pigs he is known all the world over, and it is quite a pleasant feature when at Walton Hall to take a walk through the Piggeries, where, as in all other departments of the estate, there is a place for everything and everything in its place.

It is impossible to omit reference to Sir Gilbert's activities on the Council of the Royal Agricultural Society of England.

As Honorary Director of the Show he has for the past ten years undertaken the work of organising this important section of the Society's operations, and the present efficient state of the Show arrangements testifies in a remarkable degree to the success which has attended his energies in the work of administration.

In order adequately to refer to Sir Gilbert's activities in the agricultural world it would require a great deal more space than is at our command on this occasion.

It is hoped that he may continue for many years to give his services to all those associations and societies with which he has been so closely identified, and thus give a good lead for his two sons to follow, which will doubtless be their aim and desire.



**SIR GILBERT GREENALL, BART., C.V.O.**

*PRESIDENT OF THE BRITISH DAIRY FARMERS' ASSOCIATION*



## THE LATE RIGHT HON. LORD BELPER.

BORN MAY, 1840. DIED JULY, 1914.

By the death of Lord Belper the British Dairy Farmers Association is deprived of yet another of its honoured Past Presidents; and in common with the country as a whole, loses the assistance of a nobleman who has rendered long and honourable service to the work of local government.

Henry Strutt, LL.M., P.C., J.P., was the second son of Edward, first Baron Belper, P.C., F.R.S., LL.D., his elder brother having predeceased his father. Lord Belper was born in 1840. He was educated at Harrow and Trinity College, Cambridge; and from manhood onward he devoted practically the whole of his life to public service, both Local and Imperial. At the age of 28 he was elected to Parliament as Liberal Member for East Derbyshire, which constituency he represented from 1868 to 1874. In 1880 he was returned for Berwick-on-Tweed, only to vacate the seat three months later on succeeding to the title.

Six years before his succession he married Lady Margaret Coke, a sister of the Earl of Leicester, and leaves a surviving family of one son and five daughters.

The disturbance in the Liberal Party over the first Home Rule Bill resulted in Lord Belper declaring himself a Liberal Unionist. With advancing years his views tended to become more distinctly Conservative, and from 1895 to 1906, during the Unionist Administration, he held the appointment of Captain of the Hon. Corps of Gentlemen-at-Arms. He was also A.D.C. to the King.

Lord Belper was Chairman of the Nottinghamshire Quarter Sessions for upwards of thirty years, and Chairman of the Nottinghamshire County Council for twenty-five years—in fact ever since it was formed until his death. His knowledge of local administration made him an exceedingly useful man to his party in the House of Lords, and led Lord Salisbury to select him to pilot the Workmen's Compensation Bill through that House in 1897, while in later years he was given charge of other important legislative measures, tasks which he invariably performed with marked aptitude. For some years Lord Belper was Chairman of the County Councils Association, in which capacity it often fell to his lot to head deputations to Ministers.

Throughout his life Lord Belper took a keen interest in Agriculture. This interest was probably inherited from his great-grandfather, Jedidiah Strutt of Belper, who was the son of a small Derbyshire farmer, and from whom dates the rise of the Strutt family. Jedidiah Strutt was a man of considerable originality who, after being apprenticed for seven years to a wheelwright, and being brought in contact with the manufacture of hosiery through his marriage with the daughter of a small hosiery manufacturer, invented a machine for making ribbed hose, called the "Derby Rib."

This led to his joining his brother-in-law as a manufacturer of hosiery, and later on to his becoming associated with Arkwright of cotton spinning fame.

Lord Belper's practical knowledge of and interest in Agriculture has been testified to by the many appointments which he held from time to time. Thus we find that he was elected (*a*) President of the Notts Agricultural Society in 1891; (*b*) President of the Shire Horse Society in 1893; (*c*) a Governor of the Midland Agricultural and Dairy College in 1895—a position which he retained until his death; (*d*) a member of the Departmental Committee on Agricultural Education in 1907–8, and (*e*) President of the British Dairy Farmers' Association in 1909.

At one time his Lordship was a breeder of Shire Horses of some repute, and it was probably in the last decade of last century that his stud reached its zenith, when in 1893, 1895, and 1896, his "Rokeby Harold," probably one of the best sons of the famous Harold, won the Challenge Cup of the Shire Horse Society in London, the trophy thus becoming Lord Belper's own property.

During the last twenty years of his life Lord Belper devoted much time and energy to advancing Agricultural Education, in which he was a firm believer. It was this interest which led him to take a leading part in the establishment of the Midland Agricultural and Dairy College near his residence at Kingston-on-Soar. What that institution owes to him would take long to tell; suffice it to say that from its foundation until his death he remained one of the most active of the College Governors: that at his own expense he made several valuable additions to the College, and that he never ceased to advocate its usefulness and to delight in its success.

It was because of his renown as a practical agriculturist, and because of his administrative abilities as an agricultural educationalist that the British Dairy Farmers asked Lord Belper to accept the Presidency of their Association in 1909, a decision the wisdom of which his actions during his period of office abundantly confirmed. Those who attended the Cheshire Dairy Conference of the Association will remember how strenuously he then advocated the establishment of a Central Research Station for Dairying, in which respect we may rejoice that he lived to see his ideas, in some measure, carried out.

This brief sketch covers but a small portion of Lord Belper's many activities. An earnest supporter of the Volunteer forces he was himself in command of the South Notts Hussars for seventeen years, afterwards occupying the rank of Honorary Colonel. For some years he was a Director of the Midland Railway Company, and of Messrs. Crompton and Evans' Bank. He was a D.L. for Notts, and a Justice of the Peace for Notts, Derbyshire and Leicestershire.

His Lordship was a skilful amateur painter, and as evidence of the abounding energy of the man it may be mentioned that despite the constant calls which public business made upon his time, he was able to devote considerable attention to art.

These Memoirs may fittingly be concluded by quoting the words

of one who knew him well, who said "that as a country England was more fortunate than any other country in possessing a number of able men who devoted their time, talents, and experience without reward to the problems of local government. Lord Belper was a splendid example of that type; he took a leading part in practically every department of county business. His activities were not confined to Nottinghamshire, but in Parliament and other wider spheres he deservedly won a high reputation as a wise Counsellor and skilful Administrator."



## MILES BENSON (1872-1914).

By WILLIAM ASHCROFT, Chairman of the British Dairy Institute Joint Committee.

By the death of Mr. Miles Benson at the comparatively early age of forty-two, the Dairy Industry of Great Britain has lost one of its best experts; the British Dairy Institute an unrivalled exponent and teacher; the British Dairy Farmers' Association and the University College, Reading, a most loyal colleague, and very many others, including a long list of old and present students, mourn the loss of a friend not easily replaced.

Mr. Benson came of a family long established in East Cumberland : a characteristic feature of that county is the number of small land-owners or yeomen farmers still bearing the name of "statesmen."

The Bensons of Unthank have been yeomen or "statesmen" in East Cumberland for many generations : there was a Miles Benson born 1673, died 1732 ; his grandson, the Rev. Joseph Benson, widely known as a preacher and commentator, was an intimate friend of John Wesley and one of the earliest presidents of the Wesleyan Conference.

Thomas Benson, our Miles' father, was a man of strong character, widely read, deep thinking and broad minded, much interested in education, an active worker in political and local public affairs, and a great supporter of the Wesleyan cause. His mother, still hale and active in her 82nd year, is also of yeoman extraction, her father, the late William Harrison, having been in his day a noted farmer and breeder of shorthorns.

Miles was educated at the Gamblesby Board School and Grosvenor College, Carlisle ; as a boy he was full of harmless fun, always a favourite among his schoolfellows, and ever ready to lead them in some frolic, but never guilty of meanness or deceit ; eager to be first either at play or work was a laudable ambition which remained his to the end.

After leaving school he remained at home till 1889 helping with the farm, and, taking up poultry farming, became a most successful breeder and exhibitor of silver wyandottes, just as in later years, when a hobby was necessary for relaxation, he raised himself to the first rank as a breeder and exhibitor of Exhibition Flying Homer pigeons.

Leaving home in 1889, he became a pupil at the British Dairy Institute at Aylesbury, which was then in charge of his elder brother Mr. John Benson, whose name is a household word in all matters pertaining to dairying and cheesemaking.

In the spring of 1890 he took the diploma and gained the silver medal of the B. D. F. A., and afterwards went as pupil to a number

of the best cheese and butter dairies and creameries in the United Kingdom, subsequently gaining valuable experience in the management of dairy factories in the Isle of Wight and Sussex.

In 1895 the British Dairy Institute was moved to Reading and placed under the management of a Joint Committee, representing the British Dairy Farmers' Association and University College, and Mr. Miles Benson was appointed manager, which post he held to the time of his death; how well he fulfilled the duties of that post the writer thinks he cannot better set forth than by quoting *in extenso* a letter he received from Mr. W. M. Childs, Principal of the College, and consequently always in close touch with Mr. Benson, and every word of which the writer would most sincerely endorse.

“He was a colleague of mine at Reading for a great many years and I knew him well. There is no need for me to say anything about his ability as a teacher of dairying in all its branches for it was universally acknowledged. I write of him rather as a colleague and friend. The position which Mr. Benson was called upon to fill at Reading was not in all respects an easy one. Certainly many men would have found it difficult. He was the head of an institution which in some ways was independent, and yet in other ways was dependent for its efficiency upon the co-operation of University College. The College was landlord and immediate neighbour and, of course, far larger in scale; yet the manager of the British Dairy Institute, though looking to the College staff for many services, and constantly concerned with College students, was all the time responsible to an external committee. That such an arrangement worked well was entirely due to Mr. Benson's personality. He had a singular gift of making friends, and he gained the affectionate regard of men whose pursuits and interests were quite different to his own. When he came to Reading the College was young and informal; the vigour of its corporate life was still a promise rather than a fact. Mr. Benson in the friendliest and most helpful way threw himself into all the young activities, and without ever forgetting that he had his own responsibility to the Joint Committee, he became an ardent supporter of all that made for the advancement of the College. He was constantly to be seen in the Staff Common Room maintaining friendly relations with all, or—in early days—on the athletic ground among the students, or at gatherings of student societies. Those of us who remember these things can never forget the services which in a characteristically unostentatious way Miles Benson rendered to the upbuilding of our College; and it was largely owing to him that students of the dairy have never been isolated but have always had the opportunity of sharing in the larger life of the University College.

"Mr. Benson was a thorough Englishman and a thorough countryman. You could tell at once that the old strain of the English countryside was in him. It showed in his sense of humour, his fondness for old-fashioned country songs, his love for Cumberland, his love of the open air and of animals, a certain cool deliberation of manner, and a tenacious courage of which he gave signal proof in his long and distressing illnesses. It was easy enough to hurt his feelings; but Mr. Benson was a difficult man to quarrel with. In all the years that I knew him I never knew him do anything aggressive or make unnecessary difficulties; yet quiet and kindly as he was, no one took liberties with him. All felt him to be a genuine man whose word was his bond; a man loyal and steady. Such men are the salt of any institution and they win a respect and an affection which is the highest tribute that colleagues can pay to one another. His loss is keenly felt, and by all kinds of men and women. He was liked for himself—a simple straightforward kindly Englishman. I believe that he knew this and valued it, for the regard for him manifested itself in recent times in one or two special ways."

The above letter is an appreciative but just estimate of Mr. Benson, and it does not stand alone; one of his colleagues describes him as "a man who was never heard to speak an ill word of anyone, and of whom I have never heard anyone speak anything but good"; and another writes, "There are none of us but have invariably pleasing recollections of the gentle charm and quiet amiability of him who is gone"; and one who knew him intimately enlarges on the five points in his character which stand out with clearness, looking back on nearly 20 years' friendship, viz.: his self-repression, so completely free from self-assertiveness; his thoroughness; his loyalty; his courage, and lastly, his transparent intensity of purpose, simplicity of life, and intense love of his home life at Theale.

The writer could easily multiply similar quotations to show the opinion held of Miles Benson by those with whom he worked and others who knew him.

Mr. Benson as a teacher and a cheesemaker was *facile princeps*, largely because he was perfectly at home both in the practical and scientific side of everything he taught; in practice and work of every description he was himself careful to a degree and always insisted on attention and observance of minute details, and in lecturing, the same exact and systematic method of presenting facts, and their explanation gave his hearers a clear grasp of their subject. His practical knowledge was wide as it was sound; he was equally competent in the butter dairy or when demonstrating the manufacture of any variety of cheese, and he always took the greatest personal interest in his pupils, not only in their work, and in their examinations, but in their future. Closely allied to the welfare of his pupils was the affection he had for the Dairy

Institute itself ; one might say he regarded it as a father does a well-loved son ; was always jealous for its prestige and advancement, and devoted himself heart and soul thereto. As an investigator he brought to his knowledge and skill in cheesemaking the necessary qualities of patience and perseverance, in no case better exemplified than in his research and experiments on making cheese from heated milk : these experiments begun in 1905 he did not publish until they were thoroughly established, when in 1913 the results were set forth in a report prepared by himself and Mr. R. H. Evans for the "Board of Agriculture Journal." Up to the time of his death he was engaged in further experiments in the same direction, and a second report, and had other experimental work planned which he was anxious to live and accomplish ; but it was not to be.

*Thoroughness* was the keynote of Mr. Benson's work, and to that must be added an amount of courage and tenacity of purpose under difficulties which few men are capable of.

It must always be remembered that for six years he had to labour with diseased lungs and enfeebled health. In the beginning of 1908 he caught a bad chill resulting in a grave attack of pneumonia, which left behind it very serious consequences. After eight months' rest he was able to resume his work ; but at the Dairy Show of 1912 he contracted another very serious illness, and it was only his indomitable will and bright cheery optimism that enabled him to carry on afterwards. To lighten Mr. Benson's duties and keep him out of the heated atmosphere of a cheesemaking room the Committee appointed a capable cheesemaking assistant, and in the spring of 1914 his medical man having prescribed motor driving, so that Mr. Benson might benefit as much as possible from fresh air, a number of his friends, colleagues, and past and present pupils seized the opportunity to present him with a motor car.

This was turning out to be an appreciable benefit, when unhappily war broke out, and Mr. Benson, throwing himself with his accustomed energy to fill the place of Mr. Drewe, his assistant, who had been called up to active service, succumbed, alas, to a last and fatal illness.

Mr. Benson married in 1905 Miss Constance Hoare, who had been a distinguished pupil, and an able assistant at the Institute.

To her who nursed him through much illness with untiring effort, who was his right hand, and ably assisted him at all times, the sympathy of every one who knew him is freely extended, as well as to his other relatives ; and we all mourn together the loss of one who leaves behind him the record of an able, thorough and persevering worker, a modest, kindly and charitable gentleman.

## SILAGE FOR DAIRY FARMERS.

By J. A. SMITH, Principal, Eastern Counties Dairy Institute.

THE utility of silage is again becoming a very important question for English farmers.

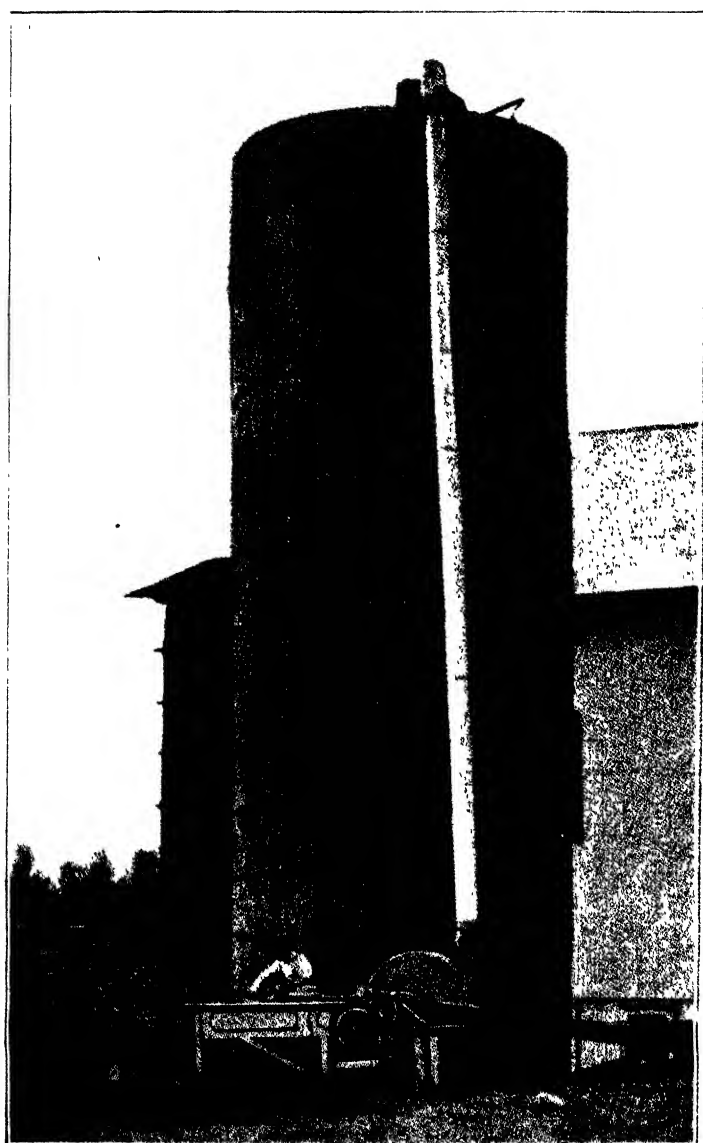
In 1885, the Agricultural Department of the Privy Council published a report on the subject, and the question was also dealt with by an Ensilage Commission. Brick or concrete silos were constructed underground and barns or sheds adapted for the purpose. A series of wet seasons had made the drying of grass into hay very hazardous, and leading landowners, such as Lord Tollemache and Lord Wolsingham, were fairly successful in their efforts. It is rather remarkable that droughty seasons are now the impelling force to bring this question again to the front. But why did the previous movement die out? Mainly because the pit system was unsuitable. It was easy to tip the fodder into a pit, but what about securing proper pressure and the subsequent removal, which should commence at the bottom of the silo?

It was here that the American farmer scored. The overhead circular stave silo was introduced and rapidly made its way. In 1882 there were only 91 silos in the United States, and now there are 750,000. Would the keen American farmers multiply silos to this remarkable extent if there was not money in it? The question is now being practically considered in the east of England, mainly through the lead given by Mr. George Jacques, of Tivetshall, a Canadian farmer who brought over his own silo and has demonstrated its usefulness so clearly that many other farmers have followed his example, and a considerable number are now working in Suffolk and Norfolk. They are made of two-piece yellow pine, complete with galvanised steel roof, dormer window, ventilators, &c., and the cost is from £50 to £80 according to size.

A medium size would be diameter 14 feet, height 30 feet, capacity 90 tons, shipping weight 8,225 lbs. This would provide sufficient silage to keep 28 cattle with 40 lbs. daily for 180 days. The floor should be concrete 4 inches thick.

Practical farmers who have chaffed their oats, tares, clover or beans and made the silage properly find that they can produce milk twopence per gallon cheaper than by any other method, and this season on many farms roots are "conspicuous by their absence," and a very serious shortage of milk is already apparent. An important point is also the great saving of labour. A crop of oats and tares is more reliable and less costly than roots; besides, there is a chance of obtaining a catch crop afterwards.

It would be a great relief, especially to the dairy farmer, to know that he was independent of the drought of summer or the frost of winter, and that there was a sufficiency of succulent food in the adjoining silo. More cows could be better kept and more calves reared, to say nothing of other stock.





Mr. Jacques states :—

“ My silage is better this year than last. I have been feeding my cattle on silage for the last six weeks, and they look better now than they did ; besides, the milk has gone up and keeps up, and all I feed is 4 lbs. of bean meal to 3-gallon cows, 2 lbs. to 2-gallon cows, and nothing to those giving less. At present I am feeding silage made from second-cut clover crop, and as soon as I get into silage made from oats, tares and beans I expect to be able to cut off the bean meal. I have a few young things I am feeding silage and 1 lb. of linseed cake to. They are doing extremely well. The little calves all get silage together with a little linseed cake and whole beans, and look well. Everyone has said, and still remarks, how much better my cattle look than theirs.

“ This proves that silage is a much better feed than roots. It must now depend on the costs. If this silage system is cheaper (and I think anyone who understands anything about farming and will look into costs will admit it is very much cheaper), besides being practically a certain crop, it stands to reason it must be the right system. As I have been practising this system in England for two years, perhaps a few remarks will not be out of place.

“ There is absolutely no disagreeable smell, provided silage is made on the modern system. Cattle do better on it than on roots, and a very great saving may be effected in corn, cake, and labour bills. As to costs, no one seems to agree as to what a ton of roots costs to grow and feed to cattle. This year they will certainly be most costly. Perhaps it will be as well to let each individual work this out and also cost of making silage.

“ As regards the silage crop, anyone can estimate cost of the crop standing in the field. As to cutting and putting same in silo, I find by putting five grain elevators on my mower I can cut perfectly clean any crop of green stuff. This year I had a very badly-lodged crop, and was told it would cost more to cut than it was worth. As I was able to cut three ways with mower, my critics admitted that I practically shaved the land. The cost of this operation, if done sensibly, is very little, and the waste nil. I got enough off one acre to keep four cows six months.

“ Compare this with an average root yield, to say nothing of the failure this year. The land where I grew this crop was very foul when I put in seed, but I noticed the stubble was practically clear after removing crop. Since then I have ploughed it twice and cultivated once, and it is to-day perfectly clean. On mixed soil land one could easily get a crop of turnips after removing the crop. I am told winter oats, tares and beans are a certain crop. I know roots are most uncertain. I grow my silage crop with 5 cwt. of slag, therefore I can give my wheat lands a very heavy dressing of farmyard manure and what is left put on pasturages.

“ My silage cutter will handle 5 to 6 tons per hour, and it takes one man or a boy inside the silo, two men feeding cutter, and one unloading, besides an engine. As regards loading carts and hauling



on knowing capacity of machine and the distance to haul, the number of men and horses necessary can be readily ascertained and so costs estimated. As long as men and mower can work, wet weather will not hinder operations. There is also a very great saving of labour during the winter, as one man and a boy can easily feed 150 head. In covered yards only half the straw is required to keep cattle clean and comfortable when fed on silage.

"I have had two to three hundred farmers through my yards, besides meeting untold numbers at the different shows; they all admit my arguments are perfectly sound, but they rather jib at the outlay. On my taking their own figures and working out the costs of the two systems, it is perfectly easy to show that the saving effected in one year will pay for the plant; besides, one method is farming in safety street, the other, to say the least, precarious and expensive.

"I am given to understand 'roots are the bedrock to English farming.' I am prepared to prove they are the rock farmers are getting shipwrecked on. To-day, I look forward to the winter without any fear of being short of feed, and farmers say I am lucky. Is it not rather a case of foresight and adopting modern ideas? Milk is sent daily to London, and during the last two years absolutely no complaints have been made."

Another Eastern Counties farmer states that in the 13 weeks from October, 1913, to January, 1914, his cows gave 5,432 gallons of milk, or an average per cow of 1,300 lbs. for the quarter. In the 13 weeks from October, 1914, to January, 1915, his cows gave 75,014 lbs. of milk, or an average of 1,500 lbs. This shows an increase per cow of 200 lbs. in the quarter. He thinks, perhaps, he has fed a little higher in artificials this last year, but the main difference he puts to ensilage. Say he has fed higher, in the 13 weeks of last year not one cow out of the 42 was dry more than seven weeks. Out of the 50 this year, six of them have been dry the whole 13 weeks. He is thoroughly convinced now for cows and store cattle ensilage made on the modern system is the best and cheapest food. This coming year he hopes to put up another silo and try to fatten bullocks on it.

Another farmer has had his silage analysed. It contains 75 per cent. of water, against 90 per cent. water in roots. There are 17½ per cent. of food units, against only 8 in swedes. He declares that he shall never again take all the trouble to preserve roots for winter feeding by topping, tailing, moulding up, &c. The silo is far and away the cheaper plan.

This is only a specimen of the testimony from those now working silos in this arable district, and no doubt in pasture counties silos will be even more useful. In making hay, even if successful, much of the food constituents are converted into indigestible woody fibre. The whole question deserves careful inquiry and is worth the immediate attention of the Board of Agriculture; failing this, perhaps it would be possible for the British Dairy Farmers' Association to themselves appoint a Commission to investigate the subject on economic, scientific and practical grounds.

## INJURIOUS FEEDING STUFFS.

By F. J. LLOYD, F.C.S., F.I.C.

UNLESS my experience is exceptional, the unexplained illnesses and deaths among live stock which annually occur must represent a very large financial loss to the farmers of this country.

As a rule these losses are attributed to the injurious effect of some feeding stuff—often, I fear, without sufficient grounds for the assumption. However, of late years many samples of feeding stuffs have been submitted for analysis to determine why they were injurious. Some of my clients have probably been disappointed when no injurious substance has been found in the material. They may not realise how very minute and prolonged an investigation is necessary to make sure that a substance contains no injurious constituent. Moreover, there are many other reasons why some feeding stuffs may have ill effects without containing any foreign ingredient. It has, therefore, appeared to me desirable to draw attention to the subject.

Probably few farmers recognise how many factors are essential in the constitution of a really good feeding stuff, how many sources of danger there are for those who use inferior foods, and the many opportunities for deceit open to those who manufacture and sell feeding stuffs.

In the first place it will be well to consider what are the conditions desired in a feeding stuff, and how far their presence or absence may affect its injurious action. The primary requisite is palatability.

### PALATABILITY.

A feeding stuff is at times submitted for analysis because the animals do not take it readily or absolutely refuse it. This is no criterion of a food being injurious. As a matter of fact, animals will often eat with avidity food which is injurious yet decline good wholesome food for no apparent reason. But of course there are reasons. The first is that animals, like human beings, often have a strong liking for some particular flavour. Thus we find animals eating acorns, as men eat nuts, often to such extent as to make themselves ill. They are mostly fond of sugar, and to get it will eat indigestible and non-nutritious stuff like sawdust. It is this fondness for certain flavours which is exploited by the makers of the condiments and spices so often sold at a most exorbitant price. The makers find some substance attractive to animals, mix it with material which is of little value and of doubtful character, and impose upon farmers who, if they had a little more knowledge, would know what to mix with the food and where to buy it at a fair price. These condiments are frequently suspected of being injurious, and apparently not without good cause.

A few which have been very carefully examined appear to consist largely of some refuse drug from which the essential constituent has been extracted. Suppose this was an alkaloid, and had not been completely extracted, and we can easily understand why animals have died with all the symptoms of alkaloid poisoning. But the agricultural analyst would not be expected to search for this. In the first place, such examination is very intricate, lengthy, and expensive; and in the second place it ought to be entrusted to an expert in such analyses. This is not done, and so the farmers continue to run the risk and, if unfortunate, seldom get satisfaction.

Just as animals like sugar they do not like acids. The pig, perhaps, will take acid food up to a point, but I believe that much of the trouble often thought to arise from barley meal is due to the whey with which it is mixed being too acid. On the other hand, some acid substances do attract animals, as for instance silage.

The dislikes of animals are very difficult to explain, but they are very marked. One thing is certain, that as regards food animals are most conservative. Hence it is very difficult to induce them to take any new food to which they have not been accustomed, or even food similar to what they have been having, if it should happen to have a new taste or smell. This, I think, affords an explanation for one remarkable fact associated with alleged injurious feeding stuffs, viz.: that frequently a most careful examination of the material fails to reveal any injurious substance. Of course there is the possibility of the analyst overlooking the poison contained in the material, and when we come to consider the many possible causes of injurious effects this will not appear so unlikely as might at first be imagined.

The second requisite of a feeding stuff is

#### CONDITION.

The condition of a feeding stuff is almost as important as its actual composition. Very often when a substance is sold at a price which the farmer calls "cheap," the material, even if genuine, is in such a condition as not really to be cheap at all. A more costly food would, by its results, pay the feeder far better than the apparently cheap food. A purchaser, therefore, should always carefully examine the *condition* of a feeding stuff which he thinks of buying or has bought. This advice cannot be too scrupulously followed.

Under the term "condition" I place several factors which a purchaser should himself look for. With regard to meals, for instance, they should smell sweet, and not acid, mousey, or musty; when loosely spread out there should be no fluffy lumps clinging together, which generally indicates "mould," and there should be no sign of seeds foreign to the material of which the meal is composed.

With cakes there should be the same sweetness of smell. One condition which is often overlooked, and which, in my opinion, is of very great importance, is the hardness of the cake. Modern machinery can crush seed into a cake which is more like a slab of stone than a feeding stuff. Now, the harder a cake is the larger, as a rule, are the

lumps given to the stock owing to the difficulty of breaking it. This is just the reverse of what should be. Such hard cakes being thought to have had injurious effects are sent for analysis far more frequently than soft cakes. I believe they do have injurious effects, due solely to their hardness, by setting up more or less inflammation owing to their sheer indigestibility.

These very hard cakes are sometimes produced by a second pressing of the seed. Before this pressing the meal is damped. If the meal is fine it absorbs the water unevenly, and when recrushed the damp places are consolidated into extremely hard, flat, round masses like buttons. When these cakes are broken, the "buttons" may be taken out whole. They are extremely hard; if cracked in two the interior is of a much darker colour than the cake and is very dense. They are sometimes found in decorticated cotton cakes, and such cakes have frequently proved injurious.

Another "condition" which a purchaser should consider is colour. Always beware of a cake or meal of darker colour than usual. Frequently these are substances which have become heated, or been heated for some reason—generally to hide a blemish. Such meals and cakes are always risky even if not injurious, while experiments have shown that they are less digestible than unheated cakes.

The next consideration is the chemical composition of a food.

#### COMPOSITION.

The guarantee of a feeding stuff, which now has to be given by every vendor—namely, the percentage of oil and albuminoids—valuable as it is, cannot be considered sufficient either as a guarantee or as security for condition. Substances will frequently comply with these guarantees and yet be far from suitable for feeding.

As a real guide to feeding value only a complete analysis is of any use. One which shows the three nutrients—oil, albuminoids, and carbohydrates, and the three non-nutrients—water, indigestible fibre, and mineral matter.

Even the nutrients may prove to be more deceptive than is generally recognised, and sometimes injurious.

These constituents may be considered in order:—

*Oil.*—In cakes made from a particular seed one rightly expects the oil present to be that natural to the seed, but whether it always is may be questioned. The oil found in compound cakes is, to say the least, very compound, and how much belongs naturally to the seeds used, how much was put in, and what was put in has been a neglected factor. Petroleum would, by the present method of analysis, be returned as oil, but the cattle might not appreciate it so much nor find much nutriment in it.

*Albuminoids.*—The substances returned as albuminoids may or may not be true albuminoids. All nitrogenous vegetable compounds

are included in the term, but that these have very different feeding values is well known.

The use of substances rich in albuminoids needs care. An excess of albuminoids is liable to produce trouble and at times fatal results. I have known it to cause the death of horses.

Soya cake, when it was first introduced, was frequently considered to have had injurious effects, which were probably due to its high albuminoid contents and its injudicious use.

*Carbohydrates.*—The term "carbohydrates" is most unsatisfactory, and the term "nitrogen free extract," which is at times used instead, is no better. They both represent non-nitrogenous substances supposed to be digestible, because when treated by an empirical chemical method they are dissolved. Thus a vast number of different substances are included under the term carbohydrates.

Sugar and starch are the most important and most valuable carbohydrates from the feeder's point of view.

The mucilage of linseed, gums, and many other bodies are all estimated as carbohydrates, and unfortunately the softer portions of the cells of plants known as cellulose are included.

Wood is cellulose of a hardened character, not capable of digestion. But by chemically treating sawdust, a portion of it is rendered soluble under the conditions employed by analysts for determining carbohydrates. That such portion is of any real value as a feeding material is doubtful. Unfortunately the Board of Agriculture, which generally looks so carefully after the farmers' interests, has decided that sawdust chemically treated is a feeding stuff. What is the result? If an analyst finds sawdust in a feeding stuff, especially a compound cake or mixed meal, he cannot declare that it is adulterated, because he cannot say whether that sawdust has been added as such or after chemical treatment. To my thinking a feeding stuff which contains sawdust is adulterated whether that sawdust has been chemically treated or not. For even if treated the whole of the sawdust is not affected, and the unacted upon portion is indigestible and useless.

The non-nutritious constituents are :—

*Water* or moisture.—This is of far more importance than is generally supposed. Feeding stuffs are not often adulterated with water, but they may contain more than is desirable. It should not exceed 13 per cent. for two reasons: the first is that an excess of moisture causes a feeding stuff to be very liable to get mouldy. Of late years many samples of feeding stuffs have rapidly gone mouldy, and it is a question whether we should not introduce a test, as has been done on the Continent, to determine what varieties of moulds are present in purchased feeding stuffs, and with what rapidity they grow. The second reason is that moisture enables bacterial growth to take place in the substance. Such bacterial growth may be accompanied by the production of injurious compounds, especially in foods rich in albuminoids. Hence the lower the moisture contents of a

feeding stuff the better, and this is why it is necessary to store feeding stuffs in as dry a place as can be obtained, and preferably where there is a current of air.

Moulds are particularly fond of an acid food, and probably the moisture first enables an acid fermentation to start, and this acid in its turn enables the moulds to flourish.

*Fibre, Woody Fibre, or Indigestible Fibre*—which are three names for the same materials—consists of those hardened portions of the plant not rendered soluble by the empirical method of analysis now in vogue for the estimation of carbohydrates. These substances seem to have very varied effects upon animals—sometimes proving injurious, and at other times not. Hence the question of how far woody fibre is injurious must depend largely on the use to which the food is put. It will also depend partly on the character of the woody fibre. Thus wheat husks contain a large amount of silica, and consequently are far more indigestible, especially for pigs, than barley husks. Yet it is not uncommon to find barley meal containing wheat and other husks.

Then again, in cakes, especially cotton cakes, the quantity of woody fibre is not alone a criterion of its indigestibility. If the cotton cake contains a large amount of cotton adhering to the husk it is far more dangerous than if the husk is free from cotton fibres. These fibres are said to bind the material in the animal and so give rise to trouble out of all proportion to the actual quantity or weight of husk present. In compound cakes and meals many problems arise as to the nature or character of the woody fibre, quite apart from its quantity.

Unfortunately neither the quantity nor nature of the indigestible fibre are alone sufficient guide as to whether a cake or meal will be injurious or not. Much depends upon the animal to which it is fed. A meal which contains cotton-seed husk may be quite suitable for grown-up animals, and yet most dangerous to young calves.

Of all seeds those of the locust bean are probably the most indigestible, and therefore the most objectionable, in any meal. Yet I have found them in a calf meal. Young animals generally cannot digest woody fibre as can older stock. Hence in a calf meal one would condemn as injurious an amount of fibre which in a meal for fully-grown cattle would be permissible. Pigs and horses are also unable to digest, in their single and comparatively small stomachs, foods which ruminants can easily digest.

Of the "indigestible fibre" which is either left in cakes and meals or added to them little further need be said, except that probably this is the most frequent method of adulterating all feeding stuffs. The substances classed under the term *Millers' Offals*, not having to be guaranteed under the *Fertilisers Act*, appear to be peculiarly liable to such form of adulteration, more especially with wood pulp or rice husks, and owing to that adulteration may become injurious.

The analyst cannot condemn such substances as injurious because they do not contain a poisonous ingredient, yet all the while he knows that they are injurious because unsuitable for the purpose for which

they were or are to be employed. Of course if a substance is sold as "Calf" or "Pig" meal and is not suitable for such purpose, he can condemn it, but I doubt whether even then the farmer would get properly compensated for any loss.

*Mineral Matter or Ash.*—The amount of mineral matter in a feeding stuff is a very good index to both its cleanliness and genuineness. Where excessively high it points to adulteration, and such adulteration is generally injurious. Thus the presence of Gypsum, or Plaster of Paris, in Barley Meals is at once revealed by the abnormal amount of mineral matter present. In all cases it is necessary to determine why the mineral matter is high. The sand is first estimated, and if this does not account for it the examination must be carried further.

*Sand.*—It is a very remarkable fact that in the majority of feeding stuffs said to have had injurious effects more than a fair proportion of sand is found. What action this has seems as yet to be very little understood. There appears to be good reason to believe that it accumulates in the stomach and sets up inflammation. Certainly sand is injurious. Hence it is high time that the Board of Agriculture should set definite limits to the amount of sand allowable in various feeding stuffs. I consider any article which contains over 2 per cent. of silica and sand is likely to be injurious.

Such are the possible sources of injury which are discovered by the ordinary chemical analysis of a feeding stuff.

We have thus far considered injurious feeding stuffs whose ill effects are due to (a) want of condition; (b) chemical composition; (c) unsuitable application. But there are a great number of other causes which now need attention.

#### MICROSCOPICAL EXAMINATION.

In addition to the chemical analysis every feeding stuff requires a searching microscopical examination. Only in this way can many of the sources of injurious action be discovered.

Thus of late years many meals, especially those made from cereals, have been found to swarm with the spores of moulds, rusts, smuts, &c., some of which at least are known to be injurious, especially the stinking smut of wheat.

The next object of a microscopical examination is to discover poisonous seeds.

Feeding stuffs which are made from inferior or improperly cleaned seed may often prove injurious owing to the presence of seeds having a distinct poisonous effect upon live stock. One can scarcely imagine any manufacturer, whose reputation and business depend upon the success of his goods, knowingly allowing such seeds to enter into any of his feeding stuffs. Nevertheless at times they do, and the cause is generally carelessness or ignorance.

Mr. Harold C. Long, in his valuable work on Common Weeds of the Farm, devotes a chapter of nearly 50 pages to Poisonous Plants, many of which produce poisonous seeds, liable to get as impurities into feeding stuffs. One might say: True, but are they present in sufficient quantity

to be injurious ? That seems to me a question which it is very difficult to answer. For instance, one cannot say how far the small sample sent to the analyst may represent the bulk ; what quantity of the food might be consumed daily, or whether some of the animals might not be peculiarly liable to the particular toxin present. Personally, I think it wiser to be on the safe side and to condemn feeding stuffs which contain any known poisonous seed. These home-grown seeds are not by any means the only injurious ones liable to get into feeding stuffs. There are many foreign seeds also, one of the most fatal being the Castor Bean. Hence the microscopical examination of a feeding stuff for injurious seeds may take almost as long as the chemical analysis.

#### SEEDS PRODUCING PRUSSIC ACID.

It has recently been found that injurious effects have been produced by seeds which, when moistened and warmed, undergo a chemical change and produce prussic acid.

These seeds contain chemical compounds termed glucosides, which easily undergo this change. As is well known, such a substance is present in bitter almonds.

Some experiments have shown that even linseed, if allowed to ferment, may produce small quantities of prussic acid.

Far more dangerous in this respect are the Java beans, which about 10 years ago played havoc with so many animals in this country.

#### BACTERIA.

In addition to the spores and growing mycelium of various moulds, many feeding stuffs contain bacteria. According to my observations, every feeding stuff contains bacteria characteristic of itself. A striking illustration of this is found in the case of Soya cake. There is no evidence to prove that these bacteria are in themselves injurious ; but there is evidence to show that indirectly they may become so. Thus I find that foods rich in albuminoids contain organisms especially able to feed upon or break up these albuminoids.

The decomposition of albuminoids is, however, frequently associated with the production of bodies which, if not true alkaloids, are very similar in their toxic action to alkaloids. The feeder should always beware of allowing damp and heated food to remain for any length of time unconsumed, especially when this food contains seeds or meal rich in albuminoids. I am inclined to think, after a long study of the subject, that many cases of poisoning which have not been explained were due to bacterial action in the food. In fact one is tempted to believe that the many cases of poisoning due to the consumption of leguminous seeds (peas and beans especially) are not to be explained by the presence of a poison actually present in the seed as by the formation of such poison by bacterial action. Take, for example, lupins, which on the Continent have caused great losses. The toxicity of the seeds seems to vary greatly, and it has been found that heating with steam under pressure partly destroys their injurious action. Whether this is due to modification of the toxic chemical compound or to destruction of bacteria capable of producing that compound has not been proved.



Whatever the explanation may be, the fact remains the same that many leguminous seeds are most injurious, while some remain so after heating.

The deaths among the Bristol Tramway Company's horses, due to the feeding of Indian peas (*Lathyrus*), now 20 years ago, was one of the most striking illustrations of the serious effects of these injurious feeding stuffs.

At times feeding stuffs may get contaminated with well-known disease-producing organisms. This is said to be especially the case with the anthrax bacillus, which appears at times to get into or on to cakes from the bags in which they are made. How far feeding stuffs may be the cause of those insidious diseases—foot-and-mouth disease and swine fever—the organisms of which are ultra-microscopic, we do not know, the subject never having been properly investigated. But, in view of the difficulty which has been found in tracing many of these outbreaks, it would seem desirable that this possible source was not overlooked.

#### POISONS.

Such are the sources of injurious feeding stuffs which may be considered more or less natural, or due to accident or carelessness. Another, and by no means infrequent source, is the presence of actual poisons.

Rice husks were at one time employed for cleaning tinned or galvanised plates. In the process minute and also fairly large portions of metal, often needle-shaped and very sharp at least at one end, get broken off the plates. In fact it is largely to remove these "needles" that the husks are used. After being so employed they are of course useless. Yet I have known them sold for feeding purposes, and produce serious injury before the fraud was discovered.

Of other poisons, lead, arsenic and copper are the most frequently found. Lead may be due to acid foods, *e.g.*, whey or grains being stored in leaden vessels. Arsenic or copper may have been employed as sprays or insecticides, and not be present in more than mere traces. But the former may have been wilfully added to the food. The moment, however, we come to wilful poisoning a whole host of substances may be present and have to be systematically searched for. This search would include an examination for all those alkaloids which may be used as poisons.

There are, however, some alkaloids present in the well-known poisonous seeds, and, if such seeds have been found during the microscopical examination, it may be desirable to also test for the alkaloids such seeds contain.

It was my original intention to write an article on the systematic examination of feeding stuffs for injurious substances. I was requested to first deal with the subject more or less from the dairy farmer's point of view. This aspect has induced me to write at such length that the scientific side must be left for a future contribution. I trust this account of my experience may lead dairy farmers to take more interest in the feeding stuffs they use, and in how they use them, and that in the future less may be heard of injurious feeding stuffs.

## DAIRYING IN CANADA.

By WILFRID SADLER,  
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It has recently been said by the Hon. Martin Burrell, Minister of Agriculture for the Dominion of Canada, that the Dominion is to-day confronted with two great problems—the heavy increase in the cost of living, with the consequent burdens entailed, and the increase of urban as against rural population. He continues that to increase the farm output, to improve the conditions of rural life, to swell the numbers of those who till the fields, is to do something towards solving the greatest problems and averting many of the manifest evils that face us in modern life.

Authoritative utterances must ever cause the thinking man to ponder, and it would be futile to discuss any phase of the rural life of this vast country, and any phase of its great agricultural industries, without a due and reverent regard to the general economic situation.

The total population of Canada increased from 5,350,000 in 1901 to 7,200,000 in 1911, or 34 per cent.

During that same period the urban population increased from 2,000,000 to 3,300,000, or 62 per cent., while the rural population increased from 3,260,000 to 3,900,000, or 20 per cent.

I mention this at the outset in order to show that Canada, like many of the European countries, has not been able to avoid the general tendency of migrations citywards. Consequently, any discussion relating to "Dairying in Canada" must take into consideration the fact that consumers are increasing at a much more rapid rate than are producers.

The knowledge that such a state exists provides the wherewithal to answer those pessimistic critics who contend that a diminution in exportation of dairy products from the Dominion portends in the industry a state of senile decay and gradual decline. The discussion of this point will be resumed later.

The subject allocated to me is one of such magnitude that one almost hesitates to embark upon a dissertation.

When we consider that Canada is equal in area to 30 United Kingdoms; that it stretches from the Atlantic Ocean on the east to the Pacific Ocean on the west; that the climate in some Provinces is continental—extremes of heat and cold—while in others it is mild and equable; that the soils of the prairies are virgin, while those of some of the older Provinces have been under cultivation for generations—we are forced to the conclusion that we have here the environmental variations of a continent. Again, while the Federal government at Ottawa is the representative government of the entire Dominion, each Province, in addition, has its own Houses of Parliament and its own

governmental departments. This insures that the particular needs of the particular Province shall be judicially met, and it enables a more intelligent development of the respective provincial resources.

In the question of dairying, that which may be perfectly true as regards the Eastern provinces may be quite inapplicable when the Western provinces are considered. The agriculturist to a considerable extent has throughout history followed the example of the river—taken the line of least resistance.

It was not until free trade became an accomplished fact in Britain that the British farmer, hitherto engaged largely in the growing of wheat, began to turn his attention to dairying.

For a totally different reason the development of dairying in Canada is somewhat analogous.

As the West has been opened to the settler, as the virgin soil has been made to give up its treasures of accumulated plant food, the growing of corn and wheat has been the main inducement to the farmer. The natural condition of the soil has enabled him to raise his crops at a minimum of cost, market them at a reasonable price, and retain for himself a legitimate and sound profit. As long as this has prevailed, why should he load himself with the added responsibilities of dairy farming; which system of farming, however fascinating and full of interest, is—it must be conceded—a system entailing more work, more outlay of capital, and greater risk.

In the Eastern provinces, however, particularly in Ontario and Quebec, the land has been farmed for generations, the first bloom of virginity has been rubbed off the soil, and the time came long ago when a more rational system of farming had to be followed; rotations of crops, manuring, draining, and so on.

The West had eclipsed the East in the growing of wheat, and as the need for self-preservation forced itself upon them, agriculturists saw in the breeding of cattle new possibilities for profitable farming. The older European countries, heavily populated, offered a market for dairy products no less good than that which they offered for wheat.

A wideawake government and an increasing number of enterprising farmers—some United Loyalists who had crossed the American border at the time of the War of Independence, some who, with dairying blood in their veins, had arrived from England and Scotland, and many who had been farming in the same districts for generations, saw that a market was waiting for the produce of the cow. Then came a stimulus to the industry, and the production of milk, butter and cheese rapidly increased.

It is not my purpose to present exhaustive statistical details, but to attempt a brief and general review of "*Dairying in Canada.*"

For that purpose the question may be dealt with under four main heads:—

- (1) Historical.
- (2) Industrial or Commercial.
- (3) Legislative.
- (4) Educational.

### HISTORICAL.

The first permanent introduction of cows was made under the French regime by Champlain in 1610 into the Province of Quebec. It is claimed that the farm then stocked by Champlain with 70 to 80 head of cattle has been occupied for dairy purposes continuously to the present day.

Throughout the seventeenth century, importations of the best dairy cows from Normandy and Brittany were undertaken, and the French Canadian breed which we have with us now is descended from the stocks then imported.

During the War of Independence, many of the United Loyalists who crossed the border settled in the eastern townships of Quebec, bringing with them their cattle. This large district is to-day one of the most important centres of dairying in the whole Dominion.

Lord Dalhousie, as Governor of Canada in 1821, arranged for the importation of bulls and cows from Ayrshire, and the strongest proof that his policy was sound, lasting and advantageous, is to be found in the fact that the modern dairy farmer in Quebec, Ontario, and even some of the Western provinces, renews the blood of his stock direct from Ayrshire, or through the medium of some of our most noted importers; to wit, the Ness family, of Howick, Quebec, and a number of others.

Importation and breeding continued to such an extent that in 1861 there were over one million milch cows in British North America; but in spite of this increase, the outlook for dairying could not be said to be by any means promising. Very few farmers specialised in dairying, and in most cases cows were kept as a side line. Butter and cheese were made on the farm, with a degree of precision and care in keeping with the circumstances. No attention was paid to the question of supply and demand, consequently the former frequently exceeded the latter, with the inevitable result that prices were unremunerative.

The situation was saved by the introduction of the factory system; the first cheese factory being established in the county of Oxford, Ontario, in 1864. The following year a similar factory was founded in Quebec, later in New Brunswick, Nova Scotia, Prince Edward Island, Manitoba, and in 1894 in British Columbia.

Several reasons—mainly the comparative sparseness of the population, and the wide distribution of the farms—were responsible for the limited success of the cheese factory system in the provinces to the West of the Great Lakes. To-day, practically no cheesemaking is done on the farm in Canada.

The year following the inauguration of the factory, the first exportations of cheese were recorded, in the arrangements for which Mr. A. A. Ayer, of Montreal, was largely instrumental. The quantity sent abroad reached its maximum in 1904, with a total of 234,000,000 lbs., since when there has been a gradual decline.

While to Ontario belongs the distinction of having first conceived and successfully established the factory system for cheesemaking, the first creamery for buttermaking was opened at Huntingdon, Quebec,

in 1873. The organisation of others in Quebec and Ontario rapidly followed. A regular exportation of butter began in 1840, the quantity reaching by 1850 a total of 1,300,000 lbs. In 1882 the annual weight exported was 19,000,000 lbs.; but by 1890 the quantity had declined until it stood at 2,000,000 lbs. per annum.

Five years later the steamship companies were prevailed upon to institute refrigeration, and by 1903 the export of butter had advanced to 34,000,000 lbs. Subsequent to 1907 a decrease again set in, the extent of which will be noted later. Any mention of the development of dairy production in relation to exportation would be incomplete without mention of Mr. Ballantyne, of Montreal.

From the historical point of view, the last few years have witnessed the influence of a new and abiding factor, the enormous increase in the consumption of fresh milk by the populations in our growing cities. It is not too much to say that thereby a new page has been added to the historical review of Dominion dairying.

#### INDUSTRIAL OR COMMERCIAL.

Reference has already been made to the introduction into Canada of the various breeds of cattle. At the present time the breeds principally favoured are the Ayrshire, French Canadian, Guernsey, Holstein, Shorthorn and Jersey. The Guernsey and Jersey breeds predominate in certain of the Maritime Provinces, particularly Nova Scotia and New Brunswick; the French Canadian and Ayrshire in Quebec; the Ayrshire and Holstein in Ontario. For some reason the Shorthorn does not appear to have met with very extended favour.

It must be said that in Ontario and Quebec in particular the farmers have become imbued with a passion for pedigree-bred milking stock. This is a healthy sign of the times, and from personal knowledge I can say that when the dairy farmers in many districts in Quebec display the same minute care, the same fervour of interest, and the same attention to detail in the production of milk for sale as they do in the breeding of dairy stock, the era of a pure milk supply will have dawned.

For many years, Ontario has been in the van in all that pertains to the industry, but Quebec is essentially a dairying province, probably even more so than Ontario, and the next few years are likely to see immense strides in every direction.

For the last 10 years or so an energetic cow-testing propaganda has been carried on by the dairy division of the Dominion Department of Agriculture, and the extent to which this has benefited the industry is reflected in the ratio of yield of milk to number of cows in 1913, as compared with the ratio 10 or 12 years earlier. During this period the average annual yield of milk per cow has been increased from 2,850 lbs. to over 4,000 lbs. Some of this increase is undoubtedly due to the systematic improvement in live stock, but underlying this, and amplifying it, has been the cow-testing and recording of yields.

It is interesting to note that under the supervision of the Federal Department of Agriculture the associations which attend to the interests of the various breeds already enumerated are carrying out the testing, and are officially recording the yields.

According to the census of 1911 there were 2,594,179 dairy cows in Canada. Ontario comes first with 1,032,079, and Quebec second with 753,134. The figures for Canada as a whole, for Ontario, and for Quebec in 1901, were 2,408,677, 1,065,763, and 767,825 respectively.

The increase in the total number of cows in the Dominion is accounted for by the provinces of the West. That a decrease is shown for the Eastern provinces is an unsatisfactory feature, but it is certainly a passing phase.

Carefully prepared statistics show that while taking the Dominion as a whole the increase in the number of cows for the decade was only 7 per cent., the increase in the value of the total product was 60 per cent. This is partly accounted for by 10 per cent. higher prices in 1911, and by the fact that a larger proportion of the total product is being sold as market milk, thus fetching an enhanced figure. But the main factor is the general improvement in the breeding and management of the cattle as detailed above.

Passing on to the products of the dairy, we find the latest returns show that there are 3,760 cheese factories and creameries in Canada, and 112 condensed milk and milk powder plants. Of these Ontario claims 1,019 cheese factories, 128 creameries, and 59 combined factories, while Quebec has 894, 576, and 698 respectively.

To those engaged in dairying in the old country, it is unnecessary to say that Cheddar is the principal variety of cheese manufactured here, for the product is familiar to every cheese merchant, cheese factor, and provision dealer throughout the United Kingdom.

Let us return for a moment to the question opened in the introductory part of this paper, relating to the decrease in the exportation from Canada of cheese and butter.

Official statistics show that the exports of cheese have declined—in round numbers—from 196,000,000 lbs. in 1901, to 155,000,000 lbs. in 1913; and the exports of butter during the same period from 16,000,000 lbs. to 823,000 lbs.

This may seem disconcerting, but looking at the other side of the picture we find that while the total production of milk was 6,900,000,000 lbs. in 1901, the quantity produced in 1911 was 9,900,000,000 lbs., an increase of 50 per cent.

It is of interest at this juncture to quote from a recent address of Mr. J. A. Ruddick, Dominion Dairy and Cold Storage Commissioner:

"Until quite recently it was the practice to rely on the figures of the export trade as the index of progress and development—mainly, I suppose, because they were the only figures available. They were never a satisfactory basis even when the home consumption was fairly steady from year to year, for the reason that they failed to indicate in any respect the volume and extent of the whole industry; and now that home consumption is growing so rapidly, partly at the expense of the exports, information based on the export trade alone is decidedly misleading."

.... "Our estimate of the situation is often wrong, because we fail to realise the quantity it takes to provide an increased

population of, say, 2½ million people with milk and milk products; nor have we taken into account some new demands which have lately arisen. In one way or another Canadians are consuming between \$30,000,000 and \$40,000,000 worth a year more of dairy products than they did 10 years ago."

This logically brings us to the most modern phase of commercial dairying in this country—the consumption of fresh milk.

In the immediate past much attention has been paid to the breeding of cattle, the recording of yields, and the manufacture of cheese and butter; too little attention has been paid to the tremendous possibilities which the sale of milk as such holds for the farming fraternity. Figures which bear on the question are not readily available; but the fact that the milk supplied to many of the factories and creameries in Ontario and Quebec is being diverted either directly or through the medium of the factory to supply the increasing demand for fresh milk speaks for itself.

The requirements of the city of Montreal alone, with a population of upwards of 500,000, have to a remarkable extent changed the trend of dairying within a radius of 100 miles. A most conservative estimate would place the average daily consumption of milk in this city at 60,000 gallons; while as high an average as 80,000 gallons daily has been reached. This is exclusive of the large quantities of cream distributed each day.

Some of this milk is drawn from Ontario, but the principal sources of supply are in the Province of Quebec itself, a province having some 70 counties, of which about 25 are to a greater or lesser extent engaged in the production of milk and cream for Montreal.

It seems justifiable to infer that while the increase of urban as against rural population is disadvantageous to the country as a whole, it constitutes of itself an actual stimulus to the production of milk for consumption: an economic situation upon which it would be most interesting to elaborate.

If we consider Toronto, the largest city in Ontario; Ottawa, the capital of the Dominion, and the many growing cities right across the Continent, we see that in the production of milk for city consumption a new feature presents itself.

The recent revisal of the United States Tariff, which removes all duty on milk imported from this country and reduces the duties on cream and butter, is another factor having an important bearing on our production, and its influence is already being felt in some parts of Ontario and Quebec.

#### LEGISLATIVE.

Without going into an elaborate treatment it is not easy to discuss our subject from the legislative point of view. There are the Federal laws, the Provincial laws, and the City laws.

Last year a far-reaching measure—the Dairy Industry Act—was passed by the Federal Parliament, the administration of which Act is invested in the Dairy Branch of the Department of Agriculture under

the Dairy Commissioner. Its object is, in brief, to regulate the manufacture and sale of dairy products, and to prohibit the manufacture or sale of butter substitutes. In addition to new features, it embodies in a revised form various Acts passed between 1886 and 1896.

The Act prohibits the adulteration of milk by various means specified, the withholding of the strippings, and the using of milk from a diseased cow. Very rigid regulations are enforced regarding the manufacture of butter. The maximum quantity of water allowable is 16 per cent., and renovated butter shall not be considered an article of trade. Oleo-margarine and other butter substitutes are prohibited as regards importation, sale, or manufacture.

With respect to cheese, there shall be no filling with foreign substance, or incorporation of any inferior curd or cheese.

Further, provision for making regulations by the Governor-in-Council is enlarged to deal with new forms of violation, new products as they may appear, and new commercial practices in the handling and sale of dairy products.

In a memorandum issued by the Department of Inland Revenue in 1910, it is stated that milk must contain not less than 3.25 per cent. butter fat, and not less than 8.5 per cent. solids not fat.

Considerable confusion creeps in when one considers the Provincial and City by-laws respecting the milk supply, a very pertinent example being those of Quebec Province and the City of Montreal.

In view of the fact that the consumption of fresh milk is increasing so rapidly, it is highly desirable that steps be taken to place the by-laws, Provincial and City, on a sound, workable basis. The whole question—at any rate, in Quebec—of licenses to dairy farmers producing milk for sale, and to milk purveyors, needs urgent attention.

In connection with the Federal Government Health of Animals Branch, regulations relating to Tuberculosis were established in May of last year. The regulations are concerned with the supply of milk as affected by tuberculosis in cattle, and mark a most decided step in the direction of the final abolition of the disease from the dairy herds of the country.

The examination of dairy cattle and the use of the Tuberculin Test by Veterinary Inspectors, with a scale of compensation in cases of slaughter, are among the main provisions. This phase of recent legislation should be of especial interest to British Dairy Farmers, and the full text of the regulations is given in the *Agricultural Gazette of Canada* for June, 1914.

#### EDUCATIONAL.

If space permitted, a treatise on this phase alone might be written. As responsible factors for the progress and success of dairying, educationalism and commercialism have been so interdependent that one scarcely knows where the dividing line should be drawn.

Using the term educational as meaning all those agencies which have had, are having, and will have a bettering and uplifting influence upon dairying in the Dominion, we find that Farmers' Institutes—a term practically synonymous with Farmers' Clubs in the Old Country



—Dairy Associations, Dairy Record and Milk-Testing Societies, Exhibits at Fairs and Shows, Illustration Farms, Model Dairy Factories, the Dominion Experimental Farms, the Agricultural Colleges, the Dairy Schools, and the Department of the Dairy Commissioner in the Federal Government, are all agencies bringing about advancement.

In the eighties, classes for instruction in cheesemaking and butter-making had been organised by private individuals, by Dairy Associations, and by the management of various factories.

An event, however, worthy of the designation "epoch-making" in educational development, was the appointment on February 1st, 1900, of a Dairy Commissioner to the Federal Government.

This appointment had three striking features: the immediate stimulus leading to it, the calibre and capacity of the man appointed, and the far-reaching after effects of the movement.

As regards the stimulus, a striking analogy to the work of the British Dairy Farmers' Association in conceiving the idea of the first British Dairy Institute is presented.

Many Provincial Dairy Associations had already been established when, in 1889, a Dominion Dairyman's Association was organised, the membership comprising delegates from those already in existence. It was due to an influential petition from this Association that the appointment in 1890 of a Dairy Commissioner was secured.

Professor (now Dr.) Jas. W. Robertson was appointed to the office. Dr. Robertson had a genius for enthusing others as to the possibilities which he himself saw on the horizon of the dairying of the future, and the immediate results arising out of his appointment included the organising of Travelling Dairy Schools in the various provinces, the establishment of Dominion Dairy Stations, Federal Demonstration Cheese Factories, and later, the institution of fixed Dairy Schools.

At St. Hyacinthe, in Quebec, was established the first regular Dairy School in 1892. Two years later the Dairy School in connection with the Ontario Agricultural College (O.A.C.) was opened under the headship of Professor Dean, and the same year saw the institution of the School for Dairying at Kingston, Ontario. About the same time a Dairy School was opened at Oka, Quebec, by the Trappist Fathers assisted by the Provincial Government.

To-day these institutions are doing good work. At Guelph, students taking the degree of B.S.A. (Bachelor of Science in Agriculture) of Toronto University, with which the College at Guelph is affiliated, may in their senior year specialise in the dairy "option."

Macdonald College (Province of Quebec), the Agricultural Faculty of McGill University, was opened for students in 1907. This College has a very well-equipped dairy department, which is devoted to "Home Dairying" as distinguished from, say, "Factory Management." The head of this department is Miss Jenny Reid, who is well known in dairying circles in Britain.

The Universities, Agricultural Colleges, and Agricultural Institutes which are in course of construction, or have already been opened in

many of the new provinces, are each making provision for instruction in the dairy branches. Courses of short duration are also given in the Maritime Provinces, at the Truro Agricultural College (Nova Scotia) and in New Brunswick. Under the guidance of the Commissioner for Dairying, an energetic educational programme is being carried out by means both direct and indirect. One of the latest features has been the establishment some few years ago of a model combined cheese factory, creamery, and experimental station at Finch, Ontario, and another at Brome, Quebec.

The work of the Dominion Experimental Farms, under the directorship of Mr. J. H. Grisdale, is rendering a great service in the conducting of investigations into the milk-producing capabilities of several well-known dairy breeds.

It is, however, to the Colleges that we look for the greatest results of an educational nature in the future. They are turning out men qualified to instruct and organise, they have the equipment for investigational work, they are training the men to undertake such work, and public opinion is ripe for an active and aggressive movement among the dairy farming communities.

The future development of dairying will depend very largely upon the application in practice of the findings of scientific investigation.

In the field of the scientific investigation of dairy problems, Dr. F. C. Harrison, the present Principal of Macdonald College, has done more than any other man in Canada; and a new impetus has lately been given to this, among other branches of work, by the passing of the Agriculture Instruction Act of 1913.

Under this Act the Hon. Martin Burrell, Minister of Agriculture, to whom it owes its inception, has made provision for the expenditure during the next 10 years of \$10,000,000.

This is to be divided among the provinces, and is to be devoted exclusively to agricultural education.

Immediate advantage of this was taken to conduct an investigation into the "Milk Supply of the City of Montreal," by Principal Harrison, Dr. Savage, and W. Sadler.

The work covered a considerable part of 1913-14, included a bacteriological examination of upwards of 1,500 samples of milk, and is the first work of such complete nature to be carried out in Canada.

The results have since been issued as a Bulletin of Macdonald College.

#### GENERAL.

In the limited space at my disposal, I have attempted to present a bird's-eye view of what seem to be the more important phases of Canadian dairying. It has been impossible under the circumstances to do more than deal with the subject from the impressionist standpoint. My hope is that the readers of this JOURNAL may glean something of the past successes, the present position, and the future prospects.

Great as has been the development during the last 25 years, little more than the framework of a great industry has been constructed.

The present is a period of metamorphosis, and one in which the changing economic conditions make it impossible to use statistics of exports to judge of the progress or decline.

The attention which up to the present has been bestowed upon the instruction pertaining to, and the manufacture of, butter and cheese, must now and immediately be divided, and a fair quota be bestowed upon the question of milk production for city consumption.

There is urgent need for the educating of the farming community and all those concerned with the production and sale of milk in the fundamental tenets of a hygienic milk supply. There is equal necessity for an educational campaign among milk consumers as to the part they must play in the securing of such.

The time has come when the idea should be inculcated by consumers that, in purchasing milk, the price they pay should have some relation to quality—bacteriological and chemical. In short, they should be educated to see that in milk, as in every other commodity, a good article is worth more to them than an inferior one.

The Government Department and the Colleges, through the many channels at their service, will be called upon to provide the impetus, the information, and the agencies which will bring about a new advancement in dairying.

It is to be hoped that in the Colleges a greater importance will be attached to the dairying branch of their educational work; that more opportunities for the specialising in this branch by their students will be offered; that it shall be made possible for those Colleges having degree-conferring powers to provide an "option" for those whose ambitions lie in the direction of scientific and practical dairy work; that agricultural educational establishments shall make it possible for the dairy farming fraternity to be offered greater facilities for short courses in the practice and theory of dairying; and that dairying, as a branch of agriculture, shall be elevated to the place assigned to it by reason of the public need and the necessities of national life.

It is not romancing to say that when these things are so, we shall see a phenomenal advancement in all that pertains to the Dairying of Canada.

# THE WORLD'S PROGRESS IN DAIRYING, 1914.

Reviewed by C. W. WALKER-TISDALE, Northallerton.

THE amount of experimental and development work in dairying which is being carried out in all parts of the world makes each year towards great and steady progress.

Dairying, the last branch of agriculture to be developed, has now become one of the most important, and in this country alone, according to statistics, the total value of the production of milk, butter, and cheese is about the same as that of wheat, barley, and oats grown, and nearly reaches the value of cattle sold as meat. Each year sees a much larger demand for milk as the public realise more and more its great feeding value, and it is of first importance that the British dairy farmer should be well informed of the results of all investigations which make for progress. The practical farmer wants information which will enable him to breed and rear the best stock, and produce the largest quantity and best quality of milk at the lowest cost. The milk distributor requires knowledge of the best and most economical methods of handling milk and distributing it to his customers in the purest condition. The maker of butter and cheese needs the most recent teachings of experimental science to enable him to produce the best quantity and quality of produce coincident with the latest and most economical practice.

To review and bring under notice the world's work in dairying for any set period is not easy, whilst to refer to all dairy matters in which progress has been made would be impossible in limited space.

An attempt has been made, therefore, to summarise the results of the more important investigations reported on during the year 1914, especially those which have a directly practical bearing in their results.

References are given to many of the reports whose findings are only here related in general terms. This will enable any one especially interested in a particular subject to procure the report, which is often of a highly technical character, and study the investigations in detail.

## I.—THE DAIRY HERD.

### BREEDING FROM TUBERCULOUS CATTLE.

The Royal Agricultural Society of England reports on a series of investigations of an extremely valuable character carried out at Woburn.

Immediate separation from the tuberculous cow at birth and isolation on premises devoted only to calf rearing specially prepared for the purpose were the features of the test. The calves were fed on

Pasteurised milk obtained from a neighbouring farm, and upon reaching an age for the fields were turned out upon land reserved for them, and came into contact only with the bull selected to complete the herd, which animal had twice passed the tuberculin test.

Examination of the carcasses carried out after slaughter resulted in a clear bill of health for each animal. It is therefore held to be demonstrated—allowing for the fact that the cows from which the cows were selected were adjudged tuberculous not from *post-mortem* but from the tuberculin test—that it is quite possible to breed entirely healthy progeny from such animals, though it is not shown they may not be particularly susceptible to tuberculosis if they meet with conditions under which infection may occur.

The investigation remains a very interesting test and provides a welcome proof of the control which breeders may exercise over the health of the young growing stock of the country.

#### BULL SOCIETIES.

The regulations as to the award of annual grants from the Board of Agriculture to Bull Societies for the encouragement of breeding by selection, should evince very marked effects in a general improvement of dairy stock. As regards the eligibility of selected animals, it is a good provision that a young bull intended for dairy purposes shall be out of a dam whose milk record is satisfactory. So also is that which requires evidence of fruitfulness in the case of bulls other than yearlings. The liberty to change an approved bull from one district to another after two or three seasons is also much to be commended.

Altogether the Model Rules published by the Board for the regulation of societies, with safeguards against abuse of the animals for which the grant is made, are promising in so far as a scheme is successful according to the principles upon which it is drawn up.

The great difficulty of the scheme, so far as dairy herds is concerned, is to find sufficient pedigree bulls from first-class dairy strains. Unless the bull is from a herd where milk production has been a speciality for many years, there is danger in lessening rather than improving the milking capacity of the progeny.

The grant only allows a maximum payment of £12 per bull per annum to an individual bull owner, or £15 to a Bull Society.

In order to obtain a first-class pedigree bull of dairy strain a very high purchase price is necessary at the present time, and this detracts from the value of the scheme to small holders for the benefit of whom the grant is primarily intended.

#### MILK RECORD SCHEMES.

The Board of Agriculture is now definitely encouraging the formation and conduct of milk record societies. For this purpose the Board is allotting grants from the Development Fund of sums not exceeding £50 per annum to societies engaged in this work.

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*"Model Rules for Bull Societies."*

*Board of Agriculture and Fisheries, Whitehall London, S.W.*

## II.—MILK HYGIENICS.

Improvements in milk hygiene following the pioneer work in dairy education have in practice been largely brought about by the growth of large dairy companies. Obviously the command of capital allows of the installation of expensive machinery for dealing with any commercial product on the most up-to-date lines. Joint-stock companies or co-operative societies organised on good business lines and administered with the application of scientific knowledge in ways that constitute and complete the best technical skill, tend to forward any industry along hygienic and nationally profitable lines.

The public demand is met for better goods, indeed, sometimes public opinion is educated to a higher level of requirements, and pioneer firms in time reap the benefit of their expensive work, while those not already equipped or unwilling to invest in progressive plant, fall out in the competition. Such is business life in these competitive times, and so does the nation at large benefit from all forward movements.

### BOTTLING MILK WHILE HOT AND COOLING AFTERWARDS.

The chief drawback which bottled milk has to combat in competition with the old system of selling milk in measured bulk is that a small quantity of milk, such as is put up in a bottle, is much more easily influenced by the changes of temperature. This applies both during transit from the bottling depot to consumer, and afterwards in the consumer's house. Where such milk travels by train, specially ventilated railway vans have been designed in order to take every advantage in summer of the cooling effect of the air when speed of the train is taken into account. In some countries refrigerator vans with ice containers are used, which is by far the better, though more expensive, plan.

After this, the keeping qualities of the milk depend upon the treatment meted out to it by the householder, who is advised to keep the bottle of milk in a vessel of cold water till opened for use. Obviously this is not always done by the consumer, who, subconsciously perhaps, expects his bottled milk to possess keeping qualities equal to those of sterilised milk.

It remains to make the bottle in which it is marketed "foolproof" to the householders' requirements, and experiments to this end are constantly being desired and methods tested.

One of these has been the attempt to ascertain if bottling the milk while hot has decided advantages over cooling before bottling. The fact that—especially in the days when "loose" or "bulk" milk was treated with preservative compounds—the loose milk remained sweet longer than that purchased in bottles, has always proved a strong summer argument against buying milk bottled in the pure state.

The United States Department of Agriculture has been concerned in experiments where the milk has been bottled as it came hot from the pasteuriser and cooled in the capped bottles by subjecting them to a

blast of cold air. This is a process requiring more time than that of cooling by water, which is not permissible except under conditions that require the use of inconvenient and less hygienic stoppers than it is now the custom to use.

It remains to be seen whether this method is applicable to practice outside the laboratory—a point which it is stated the Department is following up by further work, as obviously the commercial value is the point deciding the final result.

Bottling milk hot is hardly likely to reduce the cost of marketing milk in bottles, but it is a further guarantee against contamination after bottling—as may happen in cooling in bulk. Whether it will prolong the “life” of such milk by delaying acidification in the bottle remains to be proved, as the experiments can only be said so far to be of a preliminary character.

#### BOTTLING MILK IN RED GLASS.

Another trial method to a similar end has been engaging the attention of investigators in this country who were becoming interested in the possibilities of development regarding the antiseptic action of light on milk. The decided action of certain light rays in forwarding the mischief due to bacterial action and the supposed deterrent power of the red rays led to the idea that milk bottled in red glass would keep good appreciably longer. No further confirmatory experiments appear to have been published, though the advocates of bottling milk would probably welcome a further safeguard in this direction, as the public demand for milk in bottles is undoubtedly growing.

#### COUNTING BACTERIA IN MILK.

A most interesting investigation for the purpose of discovering a more simple and quicker method of examining a sample of milk for the number of bacteria present is reported upon by the New York Agricultural Experiment Station.

Examinations that formerly took days, owing to the necessity of preparing and incubating a plate culture, are done in the course of a few minutes with more certain and more thorough results. The reliability of this method is based upon a great number of counts.

There are remaining, however, several difficulties not yet solved, the existence of which do not permit of substituting the microscopic count altogether for that obtained from the plate culture.

For instance, it is not yet satisfactorily understood to what extent dead bacteria are detected or remain unseen by the reagent now in use. And until this is known, raw and pasteurised milk samples cannot be judged alike on similar results.

The newly-tried method has the advantages: that it is a quick test; probably takes into account those types of bacteria that do not

develop on the plate; the apparatus required is much simpler and it does not need a trained bacteriologist to investigate.

"The improvement of market milk supplies is primarily an economic question which involves the grading of milk and the paying of a better price for that of high grade. The microscopic method of milk examination will aid in bringing this about, because it permits the establishment of grades involving a bacterial standard more readily than the plate method.

"There are two grades into which milk can be divided naturally by this method, each being separated from the other by a fairly distinct border line. One includes those samples of milk in which bacteria cannot be seen readily after searching a few fields of the microscope, and which usually give a plate count below 100,000 per cubic centimetre. The other includes those samples in which bacteria can be seen readily in a few fields of the microscope, and which ordinarily give a plate count above 100,000 per cubic centimetre.

"There are no other natural points by which more grades can be established, and any such grades must be arbitrarily fixed by more extensive investigation and by practical experience."

#### MUNICIPAL MILK DEPOTS.

Of the various Municipal milk depots inaugurated during the last few years, that of the City of Bradford continues and is doing good work.

One must realise the business difficulties in the way of successfully running such an institution on truly hygienic lines to a profit. So much expenditure must be allowed for the free supply of milk to the Health Department in furtherance of the idea, which usually leads to the starting of Municipal milk depots, *i.e.*, a supply of reliable milk for the sustenance of children whose parents are not in a position to provide it. No doubt the extreme cost of this free supply when extended as requirements grow becomes an intolerable burden on the rates to the economising section of a Municipal Council.

The City of Bradford Milk Depot Balance Sheet for 1913 and 1914 shows an expenditure in excess of income amounting to only £136 odd, not taking into account a sum expended on new buildings.

This is on a purchase of milk and cream costing £4,287, and is very favourable compared with the heavy losses some of the Municipal dairies, now wound up, have shown.

#### ELECTRICAL STERILISATION OF MILK.

This has been a matter of investigation in several directions lately, one of these being reported as having been conducted by the Health Department of the city of Liverpool, the work extending over a period of two years.

Some considerable testing had to be gone through in deciding

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*City of Bradford Annual Report of the Medical Officer, issued July 1st, 1914.*

*"Electrical Times," May 7th, 1914.*



upon a suitable form in which to apply the electric current, various methods being tried before a satisfactory one was reached.

The bare fact of applying electricity to the milk was no solution of the difficulty of putting into practice the theory that an electrical discharge would result in sterilisation. By some methods, when the destruction of bacteria was effected, the constitution of the milk was injured, and the flavour spoiled, so that obviously such had no commercial or hygienic value.

But finally it was determined that milk could be sterilised, or nearly so, and preserved in a palatable and nutritive condition by a method which subjected the milk to the effects of a rapidly alternating current of electricity at high potential. By this the bacterial contents of the milk are reduced to a minimum, and the milk remains unchanged in its chemical constitution.

The milk is made to pass through a tube apparatus in which it is subjected to the electrical discharge, and the germicidal effect is nearly complete, except that it is not thorough upon some types of bacteria not recognisable as pathological in character, so that the treated milk is quite free from both milk-souring and disease-producing germs.

After the satisfactory trial of experimental apparatus the municipality erected a large plant at the Corporation Milk Dépôt, and here some difficulty was experienced owing to "charring" or burning of the milk occurring, thought to be due to some irregularity in the milk flow. Finally this was found to be because of the unsuitability of some part of the apparatus which contained an aluminium electrode of low conductivity. This was replaced by one of copper and some smaller supply tanks fitted which served as a safeguard against charred milk getting into the main supply.

Bacteriological tests made upon the control bottles from time to time showed most satisfactory results. It is claimed that milk bottled after electrification will keep three or four days, though the temperature at which it is maintained is not mentioned. Supposedly this would be ordinary atmospheric temperature. The milk is stated to be in every particular equal to "raw milk" and perfectly satisfactory as a food for infants.

How far such results make the electrical method a good substitute for Pasteurisation and refrigeration remains to be seen in practice on a larger scale, for the city milk dépôt only dealt with a maximum of 125 gallons, daily.

Certainly, the extended efficiency of such a desirable agency as electricity in the handling of milk is much to be desired. If the risk of burning milk when handled in quantity can be safeguarded against, and the charge sometimes levelled against Pasteurisation of disturbing the digestibility of the milk can be refuted, it would appear to be mostly a matter for the electrician to devise and erect suitable plant for dealing with large quantities of milk. Progressive dairy companies might then be disposed to consider the installation of such plant.

### THE PURIFICATION OF DAIRY WASTES.

This subject illustrates one of the most serious problems which confronts creameries and cheese factories wherever they may be situated. The waste liquids from a dairy of any type are always troublesome even in a system of pipe sewage drains feeding a large town main drainage system, owing to the fact that fat is deposited and the large amount of soluble albuminoids present cannot readily be suitably disintegrated.

In situations where discharge must be into an open road channel, or a stream, or the slower moving contents of a ditch, there is generally a nuisance arising, and consequent interference by local authorities. Nor is it easily practicable to use such waste for irrigation purposes, as the dairy waste is really of a much more complex and variable character than ordinary sewage, and not amenable to the same treatment for purposes of purification.

The author of the article under review advances the opinion that grass land is the most suitable of any for irrigation by dairy waste. He also decides that a system of precipitation of solids is far preferable to liquefaction of same by any septic tank treatment.

Also that tank liquor derived from dairy waste is apt to become extremely acid, and that the best type of filter is of a deep percolating kind admitting of the fullest oxidation of the liquid.

A great deal of experimental work has been carried out with a view to finding a simple and effective method of sewage disposal for dairies, but so far none has been evolved. Much further work is needed in connection with this problem.

### FAULTY MILK, ITS DETECTION AND PREVALENCE.

A very instructive article on farm investigation into the treatment of faulty milk in cheesemaking is given in the "Board of Agriculture Journal." Unfortunately, practical as it appears to be, the methods advocated are applicable only to farm practice where supervision of the source of supply is part of the same day's work.

What is really required in the cheese factory, to counteract the impossibility of individual supervision in details of supply, is a scientific method of detecting faulty milk in bulk before renneting.

If this were possible by some test as simple as that of ascertaining acidity or fat contents, a great achievement would be gained.

So far as the article under review is concerned, it was demonstrated that scalding milk from cows with defective udders and mixing afterwards with sound milk was a good way of overcoming the difficulty in the way of making a good cheese. The scalding killed the taint, and in the mixed milk had no deterrent effect on the action of rennet and ripening organisms. More starter was found necessary to ripen the milk.

### III. MILK ECONOMICS.

#### COST OF FOOD IN PRODUCTION OF MILK.

The investigations into the cost of production, based upon the value of rations fed to milk cows, has occupied the attention of various

*"The Journal of the Board of Agriculture," Vol. XX., No. 9. December, 1913.*

public bodies during the last few years, and the reports of some of the colleges and County Councils are instructive.

The South Eastern Agricultural College report for the counties of Kent and Surrey indicates the examination of roughly 600 cows during the 12 months. Cows yielding 600 gallons of milk annually were the commonest (25 per cent. of the whole).

Those yielding 500 gallons (21 per cent.) and 700 gallons (19 per cent.); the two extremes being 1,238 gallons, in a milking period of 49 weeks, and 279 gallons in 36 weeks.

It is shown that an average cow costs for maintenance about £13 a year or 5s. per week for food alone.

The average yield of all the herds was 681 gallons, the best herd giving 756, and the worst an average of 604. The value of the milk yielded by the best cow, taken at 8d. per gallon, was £41 5s. 4d., and that of the worst £9 6s., the average of all the cows throughout the test being £22 14s.

The scheme of the University of Leeds reports on complete records for 12 months of 141 cows. Nine cows yielded over 1,000 (one thousand) gallons each, and eleven 400 gallons or less, whilst the major section, 35 in number, each gave between 601 and 700 gallons. The highest yield is for a sixth-calf cow, which gave 1,341 gallons in 48 weeks; the lowest being 192 gallons in a 26 weeks' milking period.

Valuing the milk at 8d. a gallon, cows in the best herd produced milk of average value £28 9s., and in the worst herd averaged £15 19s.

The best cow yielded milk value £43 16s., and the worst £6 8s. The average value of the milk from each of 141 cows was £32 7s.

The cost of food per gallon is shown to vary from 5·7d. to 7·8d.

The University College, Reading, reports on investigations in Buckinghamshire. The average yield per cow of the herds is 656 gallons; the lowest being 535 gallons, and the highest 830. Ten of the 600 odd cows under observation yielded over 1,000 gallons each during the year, one reaching 1,570 gallons.

Generally the average cost of food for 1,434 cows, with an average daily yield of 2·14 gallons, works out at 8·95d. per day or 4·18d. per gallon.

#### SYNTHETIC MILK.

The introduction of methods for the manufacture of artificial milk has caused a considerable amount of stir in the milk trade, and both farmers and dairymen have been much perturbed as to the damage this artificial product may do to the fresh milk trade.

The invention is that of a German scientist, and the process, a comparatively simple one, has been adapted for commercial use, and not only has milk been made but cheese and butter also produced.

*South Eastern Agricultural College, Wye, Kent, 1914. Third Report. "Cost of Food in the Production of Milk."*

*University of Leeds, 1914. Third Report, No. 91. "Cost of Food in the Production of Milk."*

*University College, Reading, 1914. Preliminary Report. "Cost of Food in the Production of Milk."*

*"Chemical World," London. Vol. 2, No. 10, 1913.*

The base of synthetic milk is the Soya bean, claimed to contain 40 per cent. of soluble casein equally as nutritious as that of milk and fat of a more assimilable kind than milk fat.

The manufacture of the milk is somewhat on the following lines, according to the definition of the patentees. The finely-ground Soya beans are mixed with water containing phosphates of soda, and after being allowed to soak the mixture is slowly heated and just allowed to boil.

The residue is filtered off and pressed, milk sugar, sodium-chloride and carbonate of soda are added to the filtrate, and sesame oil or other oil mixed in suitable proportion with the solution, to produce an emulsion.

The milky liquor obtained is suitably diluted and it is stated can be manufactured at a cost which will allow of its sale at 2d. a quart. The chemical analysis of the finished emulsion shows a very close composition to that of cow's milk. Indeed, but for the fact that the exact nature of the proteins of the natural animal milks are as yet unknown and therefore cannot be imitated in detail, there would be very slight differences to be found by the most critical examination. That synthetic milk is really an excellent substitute for the original article has yet to be proved. Should it ever prove likely to compete seriously with cows' milk we foresee the necessity of farmers claiming Government help in making it illegal for any other than the product of the mammary glands of animals to be allowed to be sold as "milk."

#### CO-OPERATION IN DAIRYING.

IRELAND—The stronghold of Agricultural Co-operation in the British Isles, shows considerable progress in the number of the new societies formed and in the increase of turnover of existing societies. Altogether there are now some 985 agricultural and dairy societies in the country.

The Irish Agricultural Organisation Society, whose excellent work is well known, reporting for the year ending June, 1914, states that the creameries, including auxiliaries, had increased from 416 to 427, and with the newly introduced continuous cropping system, further creameries will be opened, and the winter supplies of milk to present dairies improved.

The great difficulty of obtaining adequate supplies of milk in winter to the creameries has still to be overcome, and until this is effected Ireland will not be able to obtain the advantages held by the Danes in the English market.

ENGLAND AND WALES.—There is now manifesting itself a growing desire on the part of farmers in general for the advantages that are to be derived by the formation of Agricultural Co-operative Trading Societies through which requirements may be bought and the produce of the farm sold.

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*Irish Agricultural Organisation Society. Annual Report, Plunkett House, Dublin.*  
*Agricultural Organisation Society. Annual Report, 31st March, 1914. Tothill Street, Westminster, S W.*

The burden of education in this matter has rested largely upon the Agricultural Organisation Society, which, now in receipt of a large grant annually from the Government Development Fund, has been able to greatly extend its propaganda work.

In the latest report of the Society it is shown that the total membership of Agricultural Co-operative Societies in England and Wales on December 31st, 1913, was over 46,000, and the value of the business transacted during that year was £2,144,000.

Of the total of 539 societies the results of 33 engaged in dairying are recorded. These dairy societies have a total membership numbering 3,348, and sales during the 12 months amounted to close upon £509,000.

#### THE MILK AND DAIRIES ACT, 1914.

This Act, which applies only to England and Wales, has been arranged to come into operation on October 1st, 1915. A sister Act applies to Scotland.

It is very comprehensive so far as action can be based upon the present knowledge of direct connection between the outside matters affecting milk and the milk itself.

The first section prohibiting the sale of tuberculous milk affects the cowkeeper, and will mean a closer inspection of animals and sheds by the wholesale milk companies, as no one is absolved from responsibility by the neglect of the first responsible person.

Also the section covers milk "for use in the manufacture of products for human consumption," and must for that reason affect creameries and cheese factories, leaving no excuse for the utilisation of the milk of unhealthy cows.

The second section extends the powers of local authorities in the supervision of the milk supply and appears to be very far-reaching, covering registration of dairies, inspection of same, prohibition of addition of colouring matter to milk, regulations of sale of both graded and certified milk, and general supervision of the marketing of the milk supply. It also gives more authority to the Inspector in securing samples of milk for examination from individual cows.

The third section empowers a Medical Officer of Health of a county or county borough to stop the supply from a condemned source, subject to right of appeal and "the payment of compensation in such cases as are provided" in the first schedule to the Act. According to this, compensation may be claimed in appeal by the farmer for loss due to milk supply being stopped without due cause, or neglect to withdraw an order when a good reason no longer exists for its continuance.

*No action for breach of contract lies against the milk producer whose supply is stopped by an order under the Act.*

The fourth section provides for and enjoins a county Medical Officer of Health to inspect any source of supply pointed out to him as suspected by the local Officer of Health of the district where the milk from such source is marketed.

The fifth appears to extend somewhat the power to take samples of milk from a salesman, as anyone may be deputed for this by carrying written authority from responsible persons such as Medical Officers of Health and Government Inspectors. Also the officer of one district may call upon that of another to procure him samples of any milk in which his own district is interested by reason of the supply being suspected to be tuberculous or otherwise bad.

Section 6 amends the provision of an earlier Act in reference to taking samples in accordance with this one.

The seventh section deals with the appointment and provision of veterinary inspectors.

Section 8 points out the responsibility of the Local Government Board towards safeguarding the public health in the matter of milk imported from abroad.

The ninth section deals with the establishment of milk depots by municipal authorities for the purpose of providing milk specially prepared for young infants.

Section 10 covers the enforcement of duties in the matters of this and similar Acts upon local authorities by the Local Government Board if advisable or necessary.

The eleventh section provides for penalising persons who obstruct officials in carrying out the purposes of the Act, and the remaining clauses are mostly concerned with expenses in carrying out the Act, prosecution, and interpretation. The cumulative penalties that may be incurred should be quite deterrent to any wilful offence under the Act, as the maximum of £50 fine for second offence and 40s. per day while the offence continues is not to be lightly ignored.

The first schedule states some diseases of cows in addition to tuberculosis to which Section 1 of the Act applies.

The second schedule details the procedure for stopping supply under Section 3.

The third schedule is an amendment of the Sale of Food and Drugs Act, dealing with taking of samples in relation to legal proceedings for offences under the Act.

A fourth schedule states and details enactments which were repealed by this Act.

## GENERAL.

### RECENT EXPERIENCE AND PROGRESS IN DAIRYING IN GERMANY."

Under the present circumstances of war, reluctant as we may be to ascribe any credit to a nation that is now nullifying the results of progress, it is interesting to note that no inconsiderable part of the progress in agricultural and dairying science is due to research and encouragement in Germany—a progress that was only stopped by Germany's thirst for war and conquest. The value of milk produced

in the German empire is stated to have grown to exceed the value of breadstuffs produced by nine million pounds sterling. The figures given, however, are not strictly comparative as they are not for the same year. The yearly production of milk is shown as worth £150,000,000. Still, this increase has not kept pace with the increase of population.

Through the past 14 years the spread of belief in the importance of cleanliness in dairy practice with the use of the reductase test for the determination of the reductase enzyme, which indicates the comparative impurity of milk, and that of the tuberculin test in the examination of live stock for the presence of tuberculosis, has been very noticeable.

One great factor that has helped the results forward and of itself proved of great educative value has been the encouragement of Control Associations engaged in comparing the yield and quality of milk produced with the expenditure in food. There is no doubt that these associations are powerful helps in the improvement of the milk yield and have had a great effect in the improvement of milking strains of cows, facts which are at last becoming recognised at their true value in our own country.

The growing economical need to sell whole milk is doubtless influencing the rearing of young stock by the German farmers as it is doing in this country. Instead of having a plentiful supply of the by-product, separated milk, for the rearing of calves from the best cows, the breeder has to depend upon the whole milk that can be spared for this purpose, together with the employment of calf meals, &c. This is a provoking question in practice in this country, and it is certainly held in many directions that it is impossible both to rear young stock and to sell milk satisfactorily at the same time; hence the comparatively small amount of favour accorded to Control Associations in the past.

One other item that has to be considered as a result of enterprise in German dairying has been the growth in the manufacture of secondary products of value by utilising the by-products which form a great part of the waste matter from the dairy. Such milk products as casein and milk sugar as bases for industrial manufactures and as important constituents of lactic foods are discussed. These things in Germany had already led to a demand for funds to be devoted to national research in such matters, only stopped by the outbreak of the war.

What advantage will be taken of the dislocation in this trade to establish industries working upon German patents remains to be seen, but it will be a pity if the Dairying industry of this country cannot gain something from the results of German research.

# THE POSITION OF DAIRY FARMING IN ENGLAND.

By JAMES LONG, Redhill.

It can scarcely be claimed that the progress which has been made in dairy farming since its evolution from darkness into the light of modern teaching, nearly 40 years ago, is commensurate with the time and the labour which has been bestowed upon it. It is true that in those early days the dairy farm as we know it now was not in existence. Some farmers kept cows and sold milk, but the greater portion of what was produced was employed in the manufacture of butter and cheese—almost all of which was of inferior quality. It was a point with some London vendors to deliver milk warm from the pails, which were suspended on yokes borne on the shoulders of the blue-stockinged men employed for the purpose. At that time the consumption was small—the average buyer limiting her purchase to the very small quantity required on the tea table. Milk was not largely employed as a food by the inhabitants of our towns, who consumed far less than the calves on the farms of those who produced it, and I doubt very much whether the average yield was 400 gallons per cow. So little was known of the principles involved in the feeding of cows and the manufacture of butter or cheese that the simplest questions which were asked by myself could not be answered by the first authority of the time, although in these days every student could give a decisive response.

The establishment of the London Dairy Show, followed at intervals by the introduction of dairy departments at the Shows of the Bath and West of England, the Royal, and other Societies; the publication of works on the subject; the invention and introduction of improved machinery; and, last of all, the advent of Dairy Schools, prepared the way for County Council education and better things. Intimately associated with all these movements, and others of a minor character, I think I can point out what has been neglected, and what might be done to give dairy farming its right place as a British Industry.

The great question at issue may be divided into three subjects, which in this paper are discussed in their turn. These are, the economical production of milk, about which we have still much to learn; the production of much more cheese of our very best type, and a large increase of butter, in combination with the breeding of dairy cattle on a much greater scale. There is no department of the dairy farm which cannot be improved, and although there are many practitioners whose work is magnificent, even these have something to learn in some one of its branches, while the great body of producers can be helped to do greater things with their stock, their crops, their buildings, or their plant, the yield and quality of their milk, or the output and character of their butter and cheese.



### OUR NATIONAL HERD.

Let us first deal with the production of milk, and the cattle which produce it. In 1886 the number of cows and heifers in England and Wales was 2,120,375; in 1913 these figures were only increased to 2,264,400, since which there has been a further increase to 2,484,180, practically the highest total on record. This total, however, is absurdly disproportionate to our population as well as to its large increase during the past 30 years. In France there is one cow per five persons; in Holland one per 5.5 persons; in Germany one per 5.9 persons; in Sweden one per 2.9 persons; and in Denmark one per 2.1 persons; whereas in England and Wales there is only one cow per 16 persons. I am aware that these facts are mainly due to the greater subdivision of the land, but in any case it enables the people to provide milk and its products for their own consumption, and in most cases for the exportation of enormous quantities of cheese, of butter, or of both. I am sanguine enough to believe that when we have become fully alive to our own capacity we shall be able to create an export trade of great value in those of our products, Cheddar, Stilton, and Wensleydale cheese, which take a very high place among this class of foodstuffs in the world. To increase our milk supply is a matter of first consideration, and this can be accomplished by (1) breeding more cows, and (2) by employing the blood of deep milking strains—care being taken to increase the quality of the milk at the same time. The production of butter and cheese is ignored by the large majority of milk producers, who will have nothing to do with the work in either department. There are two reasons why this is the case: first, it is not agreeable to the members of their families, and next, they believe that it involves a serious loss. There is no better work done on the farm than that performed by women—although in England it is a limited quantity. In Scotland, in Ireland, and in all the great Agricultural countries of the Continent, woman is as great a factor in the success of the farm as the man, if her work, as it should be, is less arduous. Woman's contribution as a maker of butter and cheese is beyond praise, and no phase of social life, indispensable as it is to so many who are not compelled to work, confers so much dignity upon her sex as her place upon the farm. I shall show later on that under given conditions—and these are indispensable—the production of butter and cheese is not only as profitable as selling milk, but much more desirable, whether in the personal or the national interest. In the meantime let us consider what course to pursue for the improvement of our National herd.

### THE SLAUGHTER OF THE BEST COWS.

In England there is a practice which applies almost alone to ourselves, and which is more detrimental to the progress of breeding than any which I am able to name. Contiguous to every large town, and to a smaller extent, on the farm, cowkeepers buy the best milkers they can find—and these in their prime—and having milked them as long as they can, sell them for beef. I hold the opinion that this practice makes that progress which we have a right to expect next to impossible,

however liberally Government aid is provided for the provision of bulls. These men destroy most of the best cows in the country as fast as they are bred. The slaughter of well-bred heifer calves is equally to be deplored.

#### COMBINING QUALITY OF MILK WITH QUANTITY.

I have already referred to the belief of many owners of herds that the manufacture of milk products is unprofitable. This, where the complaint is a just one, is almost entirely owing to the poverty of the milk, and here we come into some conflict with the views of those who are opposed to the standard. It is believed—and the belief is no doubt sincere—that quality is incompatible with quantity; that, in a word, if rich milkers are kept there must of necessity be a diminution in the yield. If this were really the case a good case would be made for milk selling. Many farmers who hold it make every effort to obtain more milk by good feeding, and some by more careful breeding as well, with little regard to its quality, and they loudly complain if exception is taken by the law when it fails to show 3 per cent. of fat. On this point I will only remark that the position assumed is not just—inasmuch as, while depressing the food value of milk on the one hand, there is an equally continuous fight to increase the price on the other. Whatever the price, the consumer is entitled to average quality, and this is not represented by milk containing 3 per cent. of fat quite apart from the state of the law.

#### WHAT DAIRY SHORTHORNS CAN DO.

Now let us see how far it is true that the *quality* of milk can or cannot be combined with *quantity* in actual practice. If it can be shown that ten cows—although one cow is sufficient to illustrate the point—have complied with this condition, there is no occasion for argument. What has been done can be done, and still more, for the skilled breeder raises his standard when he reaches his point. In the milking trials at Islington in 1913, of ten competing dairy Shorthorns which contended for the great prizes of the year, chiefly on the basis of yield, six produced milk containing more than 4 per cent. of fat at one or both milkings. Of these, one gave 44 lbs. per day, containing 4.45 per cent. of fat in the morning, and 5.07 per cent. in the evening; another gave an average of 57.7 lbs. of milk containing 5.51 and 5.69 per cent. of fat; while in the four remaining cases the average yield of fat was 3.7 in the morning and 4 per cent. in the evening. Of 11 heifers, eight gave over 4 per cent. of fat at one or both milkings. Of these, one gave 5.02 and 5.05 per cent., a second 4.33 and 4.49 per cent., a third 4.15 and 4.76, and a fourth 4.56 and 5.14 per cent. In this class ten heifers—for I omit an abnormal milker to be just—gave an average yield of fat of 3.92 per cent. in the morning and 4.28 per cent. in the evening. The first prize cow, winner of the Barham, the Shirley, and the Lord Mayor's cups, produced 72.3 lbs. of milk, containing 3.52 and 4.64 per cent. of fat; the second prize cow, and winner of the Spencer challenge cup, gave 57.7 lbs. of milk, containing the surprising weight

of 5.51 and 5.69 lbs. of fat per cent; while the first prize heifer gave 42.9 lbs. of milk, containing 5.02 and 5.05 per cent. of fat. At the Show of 1914 the winning dairy Shorthorn gave 58.55 lbs of milk, containing 4.84 and 5.72 per cent. of fat—this being the only record I possess—but the figures will speak for themselves.

#### DUTCH CATTLE—THE WORK OF THE HOLSTEIN SOCIETY.

We have now to consider how the cows of the country can be improved on the lines which these figures indicate. One man can do much, but he must labour for years, and this fact is illustrated in the work of Dr. Herbert Watney, Lord Rothschild, Mr. John Evens, and the late Mr. George Taylor. A recent occurrence points us in another direction. It is well known to men of experience that Dutch cattle are very deep milkers. I called attention to their performances many years ago, after a visit to the United States, where numerous cows have produced from 1,500 to 2,000 gallons of milk and 700 lbs. to 900 lbs. of butter in one year. At the last International Exhibition at Amsterdam, there were such great performances that the late Earl Egerton and Sir Walter Gilbey made some selections from the best cattle exhibited—all of which I examined—which they subsequently imported. With the advent of the British Holstein Society, it was recognised that without the introduction of blood from headquarters, no progress could be made, and to this end pressure was put upon the Government to permit of the importation of new stock. By good fortune this permission was granted in time to enable the Society to complete its work before the commencement of the war. Three members were appointed to visit Holland and to select cattle on the basis of yield and quality, so far as milk was concerned. For 39 bulls and 20 heifers the sum of £4,200, or about £70 each, was paid. These cattle were sold by auction to the members of the British Holstein Society, who, in spite of restrictions, paid a total sum of £14,936 for them, thus netting for the funds of their organization no less than £10,000. I venture to say that this action forms a new chapter in the history of British stock-breeding. If a new society can do such magnificent work for a foreign variety, what might not be done for our National Shorthorns and other native milking breeds. The Holstein men have struck out a new line, in which form will not be the ruling consideration—a consideration which has restrained the milking power of British breeds. Whatever may be the result of the proposals of the Development Commissions we cannot anticipate that they will be so smart or so thorough as the farmers who control the British Holstein Society. This lead, however, might be followed by other societies, with or without a development grant, and followed at once, or we shall be placed in this position, that a foreign breed of dairy cows, owing to the courage of its admirers, will take first place in a country, the most famous in the world for pure-bred milking cattle.

#### THE COST OF PRODUCTION OF MILK.

The next question for brief discussion is the cost of production. Investigations have been made during the past two years to ascertain what it costs to produce a gallon of milk. It has been the custom

in these cases to fix the price of hay, straw, roots, and other produce of the farm, without regard to the cost of production. If the yield on one farm is 50 per cent. greater than on that on an adjoining holding, as the result of greater skill, and there is a large increase in the yield of milk in consequence, the cost per gallon is reduced. A herd of poor milkers may be fed with precisely the same rations as a similar herd of deep milkers, with the result that the milk produced costs in one case twice as much as in the other. Again, the reduced cost of production on one farm is owing to the reduced cost of the food, and in the other to the increased milking value of the cows. With good cows and an increase in the food grown upon the farm the tenant stands to gain materially. What form should this increase take? I will deal with one subject alone—the improvement of grass. In round numbers our hay crop averages 24 cwt. per acre, and the pasture grass crop is correspondingly small. This is no reflection on skilled farmers who do so much better, but it points to the absurdly small crops which are grown by the majority. With a strong belief in much greater possibilities, I have been invited by stock farmers in Surrey, Sussex, Hampshire, Wilts, Dorset, and Warwickshire, to pay them a visit, in order to witness what they have done by employing liberal dressings of basic slag. I have done so, and I find land, still unimproved, shown me as a witness, which is worth only 2/6 to 5/- an acre, side by side with improved land valued by the tenants or owners themselves at 20/- to 40/-. This land carries a great deal more stock, the death rate is diminished, less cake is required, and cows and heifers are grazed upon Downs hitherto employed only for sheep. I have frequently watched cows grazing on the Alps at an altitude of 5,000 feet, and suggested that English Down lands at 500 to 800 feet might be used for a similar purpose. Cows are now grazed upon the Downs of Sussex, Wilts, and Dorset, and in this way more stock will be kept. The crops are larger, the character of the herbage is changed entirely, and drought is much less severe in hot seasons. The work I have seen in relation to cattle fully confirms the results of the experiments conducted by the Bath and West of England Society, whose steward, Mr. Wm. Ashcroft, was good enough to assist me in my preparation for a condensed account of it for “*Making the most of the Land.*”

#### HOW POOR LAND IS IMPROVED.

Basic slag assists the dormant and almost invisible clovers to grow. With the growth of the foliage there is a corresponding growth of the roots, which penetrate deeper than the roots of the grasses common to the Downs, and thus by obtaining more water they shield themselves against the heat of the sun. With this root growth the power to obtain mineral food is extended, and in consequence of this power and of the supply of phosphates in the slag, atmospheric nitrogen is utilised, and the soil enriched for the future use of the grasses.

There is, however, another, and still more important method of increasing the production of grass upon the farm, which is recognised both in science and practice, and which I venture to think will, in

principle, ultimately affect the whole country. Poor hilly land which has suffered severely and constantly from drought, and at no time within living memory been even moderately productive, has by the following course of procedure been enabled to produce large crops of pasture grass, hay, roots, potatoes, and corn. Ploughed up and manured with phosphates a root crop has been taken and consumed. The land is then laid down to grass in a corn crop with a liberal mixture of the seeds of plants with long roots, these including cocksfoot, of which 10 to 12 lbs. are employed to the acre, tall fescue and tall oat grass, white clover, late red clover, alsike, burnet (6 to 8 lbs.), chicory (3 to 4 lbs.), with small quantities of rib grass and yarrow, and on light or sandy soils, 3 to 4 lbs. of kidney vetch. The result is amazing—large crops of hay and subsequent grazing are obtained, and continued for four years, and good corn, roots, or potatoes (13 tons to the acre have been reached on very poor land). The long strong roots of these plants obtain water and minerals from below which, with the nitrogen gathered by the clovers, enriches the surface soil as they decompose and provides for the succeeding crops of the rotation without further manuring, and thus enables the tenants of poor farms to keep stock to an extent unknown in their history. The practice of tilling the soil to a depth of never more than nine to ten inches and never ploughing below the pan, and at the same time of growing pasture plants which possess no power to penetrate deeper, accounts for the existence of so many thousands of acres of worthless herbage, while the practice here referred to accounts on the other hand for the improved growth of plants which have tapped the rich mineral deposits hitherto untouched, and with their assistance utilised free nitrogen. I have grown a number of varieties of these plants on plots and in pots to enable me to measure the length of their roots. I have also obtained others by the favour of Messrs. Little & Ballantyne of Carlisle, and these, although only the growth of some months, already confirm the statements made as to the great length and power of penetration of each species. Thus the red clover root measures 24 inches with a portion broken off, apparently reaching another foot. The tap root of young alsike measured 13 inches, although also broken short. Trefoil  $\frac{3}{4}$ -in. in diameter below the crown measured 15 inches. Cocksfoot with forty rootlets, abundantly furnished with root hairs, measured 9 inches. Tall oat grass with numerous and vigorous roots measured 8 inches, while Italian rye grass reaches a length of only 4 inches, and an equally strong plant of perennial rye grass  $7\frac{1}{2}$  inches. The roots of the poas, sweet vernal, foxtail, hard, meadow, and sheep's fescue, and dog's tail are all very much shorter and quite unable to escape the effects of dry weather on upland soils. Burnet roots reach from  $10\frac{1}{2}$  inches upwards, chicory 18 inches to 5 feet in an old plant, one plant having a crown  $\frac{5}{8}$ -inch in diameter, and young plants of yarrow 8 inches. Where Lucerne can be used—and it is advisable—the roots will reach 3 to 18 feet in length. Roots extending to the latter length I was shown at Rothamsted by the late Sir John Lawes on still-growing plants.

## IMPROVED BUILDINGS.

There is no feature in relation to the equipment of the dairy farm more important than the stalling of the cows. The fact that however clean the stalls are kept and the cows are groomed, and however perfect the drainage and ventilation, the cowhouse is redolent with smells, and the atmosphere crowded with dust and bacteria, suggests to me the value of the method adopted by Mr. Robert Mond at Sevenoaks. The cow stalls which, like the cows, are kept clean by flushing and spraying with water before each milking, are used solely for this purpose—the cattle being turned into an adjoining covered yard immediately milking is over. Here, on a chalk foundation covered with clean straw, they keep practically unsoiled—they are free to move, they breathe purer air, drink when they wish, and feed equally at will. The milk is kept in a cold chamber from the time it is drawn until it is required for sale, while, compared day by day for months with the best milk obtainable in London, as I have seen from the returns, it keeps sweet very much longer. The system is good for the cows, milking is conducted under perfectly clean conditions from the floor to the roof, the cows can obtain their concentrated rations from the manger if this is desirable, the atmosphere is absolutely free from dust, and in consequence the dirt and bacteria which enter the milk pails are reduced to a minimum, as is shown by the microscopic examination of the milk and its sound condition at all seasons, long after acidity has developed in milk obtained in the usual way.

## BUTTERMAKING.

At no time within my recollection has a better opportunity been presented to the dairy farmer for making butter with profit. For some years milk has maintained a much better price than in earlier days, when it sometimes fell to 11d. the barn gallon of 17 pints. Although, however, it is unlikely that there will be any further material or permanent increase, it is generally believed that milk-selling pays better than the production of butter. There is no doubt that as knowledge increases the consumer will demand milk which contains a more substantial weight of fat, and this fact is recognised by some of the large purveyors who already provide it. It is, however, of the highest importance that the producer should obtain from his cows as much fat as he can, inasmuch as it strengthens his hands and ensures a good price. Large dealers are always willing to pay for high quality, while, in the event of too keen competition, rich milk can be retained for conversion into butter or cheese where the equipment in labour and plant is already provided.

The average price of milk, although varying in different localities, is approximately 8½d. a gallon. This sum, however, is subject to the payment of carriage by rail, sometimes amounting to a penny a gallon, to the cost of maintaining a horse, cart, and man to take it to the station; the provision and maintenance of railway churns; and refrigeration, which involves a water supply and possibly the labour of pumping

and milking at specific hours, which may mean an addition to the wages of the milkers. This group of expenses can scarcely be less than a penny a gallon, thus reducing the market price to  $7\frac{1}{2}$ d., while, if a penny or a half-penny is paid to the railway company, it is further reduced to  $6\frac{1}{2}$ d. or 7d., which is the net sum actually received by large numbers of farmers. Can this be realised by the manufacture of butter? I not only think that it can, but that the results of combining with this work the rearing of calves from good stock will place the practitioner in a much better position than he can possibly reach by the sale of his milk. Although it would be much better if the mixed milk contained 4 per cent. of fat, I propose to assume that it contains only 3.7 per cent. Making full allowance for loss of fat by separation and churning, together .15 per cent., thus leaving 3.55 per cent. for the butter, it will be found that if the butter made contains 88 per cent. of fat, the actual weight produced from 100 lbs. of milk would be 4 lbs. At an average price of 1s. 2d. we get for this weight 4s. 8d., or, with the addition of 1s. 3d. for the separated and buttermilk—always a richer food when obtained from milk rich in fat—a total of 5s. 11d., equal to  $7\frac{1}{2}$ d. per gallon. To this might be added a guinea a cow to represent the value of the manurial constituents which are lost to the farm, where the milk is removed. Objection may be taken to the price at which the butter has been valued in consequence of the low figure to which it often falls in summer. I am, however, guided by the official quotations of the best dairy butter sold in our markets, below which no good maker's produce should fall. Thus, French rolls, although a factory blend, have been maintained at 1s. 2d. through the summer, while British butter averaged 15s. 3d. per dozen in April, 13s. 9d. in May, 13s. 3d. in June, and 13s. in July, rising to 14s. 6d. in October and 15s. in November. Market quotations, however, varied in the last month from 1s.  $1\frac{1}{2}$ d. to 1s.  $7\frac{1}{2}$ d. If I may judge from the difficulty experienced in buying a fine English brand, I believe that 1s. 6d. could be maintained through the winter if the trouble were taken to sell it. In towns well known to myself there is practically no English butter sold by retailers, who deal almost entirely in Danish, French, Russian, or Irish, with the result that the finest type of butter is quite unknown to the average consumer, to whom samples like those which compete at the dairy show would be a revelation. It is this class of butter which our people should be induced to make for the supply of the wealthy, who would pay handsomely for it. I believe that no butter reaches the English market which is equal to the best sold in Paris at 1s. 8d. to 2s. a pound, although I have known it to reach 2s. 8d. It is as superior to the material sold in our shops as fine cheddar is to common Dutch cheese, and it can be made equally as well in this country, as the prize samples at Islington prove. Some of these I have frequently purchased, and have valued at 2s. a pound when prices were lower.

Although the offal milk from 100 lbs. has been valued at 1s. 3d., this sum by no means represents the profits to which it leads. The necessity of making the most of this food inspires the breeder to take

great pains with his stock, especially as he understands that he has a balance of profit to win. The presence of more and better stock on a farm demands greater efforts to feed and rear it with economy. There is more manure, and if an effort is made to improve the grass, whether in the manner suggested above, or in some other way, it will be done, and in due course there will be an annual bunch of heifers to sell at their best, while steers can be sold at an earlier age or grazed and fed for the butcher. In this way I believe that capital can be built up much more easily than by the sale of milk.

These facts lead me to suggest the importance of providing two forms of assistance to the industry at all exhibitions of butter, *e.g.*, a tasting stall, or permission to taste in the presence of a steward on payment of a fee, and an addition to each entry in the catalogue, in which the maker quotes a price for his goods and names the quantity he has to sell. Under existing conditions, the public, who need thorough education in relation to home produce, should be invited to buy it; but there is no inducement to do so. At the Dairy Show, for example, there is a priceless opportunity for bringing the producer and consumer together, but the mere display of a large number of dusty rolls staged behind wire netting simply prohibits it. Many retailers make a much more tempting display with margarine. If it were possible for responsible persons to pay a shilling for a tasting order, and the fact were well published, assuredly many would do so. The exhibit might be increased from 2 lbs. to 8 lbs., each pound being cut up into ounce samples for sale at a penny at the tasting stall, with the description and award the butter gained printed on the paper in which it was enveloped. No effort, and no reasonable expense, should be spared in a propaganda in favour of this class of British trade.

#### THE CHEESEMAKING INDUSTRY.

It is now an axiom—although it is contrary to old-time belief—that rich milk produces better as well as more cheese than poor milk. That cheesemaking is a sound industry has long been proved in Cheshire, where farmers are probably the most flourishing in England. The makers of Cheddar in Somerset and the south-western counties of Scotland are also in the front rank of successful agriculturists, but in spite of the fact the industry does not increase, although splendid work has been done at the dairy schools in the hope of improving it. My reference to this question, however, is intended to indicate (1) that by improving the quality of the milk more cheese can be made, and cheese of finer flavour and texture; (2) that a further increase in the weight made on the farm may be ensured by that form of cultivation of grass which has been referred to above and; (3) that similar measures to those suggested in order to bring the buyer and seller of butter together should be adopted with regard to cheese. I am aware that tasting stalls have already been established, but while a sample worth a penny costs threepence, thus discouraging instead of encouraging the public to buy, it is difficult, if not sometimes impossible, to learn from what cheese the sample is cut. Here, too, there is a colossal form of ignorance



among the public, who know nothing of the flavour or texture of fine cheese. While that sold is chiefly imported, it is true that 75 to 90 per cent. of that made of our British varieties is second and third rate. We cannot supply our own people with cheese, but it is suicidal policy to make a second-class article to compete with Canada and Australia. The dealer complains that he can never obtain sufficient of the best, and I believe him because I can never obtain it myself. Richer milk, the command of more abundant herbage during the season of manufacture, a closer study of the principles which guide the maker, and perfect control of the temperature of all the apartments concerned in the work of production, cannot fail to ensure a good result. The great object should be to provide for the best market, and to leave imported cheese to supply the rest. The time has arrived when a valuable prize might be offered for a system of heating cheese and butter dairies which could be kept under perfect control.

# INTERNATIONAL DAIRY CONGRESS, BERNE, 1914.

By F. J. LLOYD, F.C.S., F.I.C.

I PURPOSE to confine my attention to the scientific side of this Congress. The subjects which it was decided to discuss were eight in number, classified into four sections, and so selected that two subjects fell to each section. I shall consider these in order, but before doing so it may be well to describe briefly what may be termed the organisation of a Congress.

The subjects to be discussed at a forthcoming Congress are selected by the Permanent Bureau of the Federation at least a year in advance. The Bureau naturally takes into account what are the questions of the day, and any wishes expressed at a preceding Congress. The subjects so selected for discussion at the forthcoming Congress are then announced, and members are requested to contribute articles upon them and upon these subjects only. In this way the subjects brought up for international discussion are limited instead of being multifarious, and members, both individually and collectively, have plenty of opportunity to consider them prior to the Congress. This has been found infinitely better than to allow any member to discuss any subject in which he may be interested, and to perchance ask the Congress to support a resolution he proposes, which the members have had no due time either to consider in all its bearings or to consult their colleagues upon so as to vote as representatives of the country whence they come.

The members who contribute papers on the selected subjects are requested to send in their manuscripts about four months prior to the holding of the Congress. If they comply with this regulation their papers are translated and printed in four languages—English, French, German, and Italian. Those sent subsequently are printed only in the language in which they are written, and thus lose much of their value. Finally all the papers sent in upon each question are submitted to a "Rapporteur-General," who is a leading authority on that subject, in order that he may carefully study the papers and the proposals of the authors, and write a short general report thereon.

Copies of the original articles are sent to every member of the Congress as long before the meeting as possible. Unfortunately, as we all know, men never will send their manuscripts by any desired date. The result is that in the end the authorities supervising the Congress find it almost impossible to get the necessary translations made and printed and circulated prior to the meeting of the Congress. The "Rapporteurs" then have a very hard task thrown upon them at the last moment, and their reports are seldom in print, as they should be, when they are presented to the Congress to discuss.

When the Congress meets the original papers are not read. Members are supposed to have read them beforehand. The "Rapporteur" on the question under discussion reads his summary, which is discussed, and if necessary any resolution which he proposes as epitomising the views of authors may be put to the meeting. Thus the general question is discussed and not the individual contributions to that question. Any member taking part in the discussion may propose a resolution, but there is not much chance of any resolution being accepted unless it well represents the feeling of the Congress. Unfortunately at the Congress in Berne the Germans were aggressive, and tried to force their views upon the members present. At least such was my opinion, stated at the time and prior to any bias which subsequent events might have induced.

We may now consider the subjects in order.

## SECTION I.—HYGIENICS.

*First Subject.*—Regulations necessary for the veterinary control of milk.

Three papers were contributed, the first by Professor Gorini, Director of the Bacteriological Laboratory, Royal Agricultural College, Milan, who drew attention to the importance of the acid and rennet-forming bacteria which he had found in the udder, and the rapidity with which milk containing such organisms curdles. Hence he considered that testing milk to see how long it could be kept was an important method for judging its purity. Unfortunately he suggested no standards.

M. Gustave Regnér, Veterinary Surgeon Conférencier on Tuberculosis to the Royal Society of Agriculture, Stockholm, took as his subject "Tuberculosis and Milk for Infants." It was a sensible paper, leading up to the conclusion that "Milk for Infants" ought to be obtained from cows exempt from tuberculosis, and milk should not be allowed to be sold for infants unless so produced.

Professor Bongert, Veterinary College, Berlin, drew special attention to the precautions necessary to ensure milk being free from the bacillus of tuberculosis and the streptococci of mastitis. There was nothing new in his paper, but it was noticeable that he stated "the Dutch method of stalling cows is the best for ensuring their cleanliness."

The Rapporteur-General was Professor Dr. von Ostertag, who went very much further than any of the contributors of papers. For instance, not content with the suggestion of Professor Regéer, he considers that Milk for Infants should be tested every fortnight by inoculation into guinea pigs.

Finally, he suggests that milk ought not to be sold except in clear glass bottles, well closed, and covered with a band of paper bearing a guarantee. Presumably this regulation was intended to apply only to Milk for Infants.

The second question discussed by this section is one of moment. It ran thus:—

*Second Subject.*—Is the systematic breeding of cows with a view to the largest production of milk detrimental to their health and vitality?

No less than 10 papers were contributed on this subject.

Dr. Schuppli, of Switzerland, considered that "a cow will lose vigour and condition, and, most important of all, will become liable to tuberculosis" if not allowed to run dry before again calving. A good milker who will not easily run dry does not get this period of rest if an attempt is made to get her to calve again at the end of a year. He stated that, "as is proved by the test milking of the Algäu cows, those which stay dry 50 to 60 days yield the most abundant supply. It can therefore be taken as an accepted fact that a rest period of two months is necessary for every cow." He continued: "In practice we follow the principle that very excellent milkers are not covered before the daily milk yield sinks below 2½ gallons, when it may be taken for granted that such cows will on the average be dry for the space of two months." This proposition appears to me to be original and good, though the standard of 2½ gallons might have to be raised for our cows. He winds up his interesting paper with the general principle that "the better the cow, and the more abundant the milk yield, the less frequently should it calve; so that, despite the unusual milk yield, the animal will have two dry months to recuperate, and be able to produce a vigorous calf and further excellent milk results without injurious effects on the system."

Professor Bøggild, of Copenhagen, came to the conclusion that, in spite of the enormous increase both in milk yield and fat production which had taken place in Denmark, due to the system of records adopted there, "the size and health of our cattle has kept step with the improvement of the milk

yield." How great that improvement is he evidenced by the following figures:—

1844	average output per cow	..	..	..	1,650 lbs.
1864	"	"	..	..	2,500 "
1884	"	"	..	..	3,300 "
1894	"	"	..	..	4,850 "
1911	"	"	..	..	6,150 "

K. Indermühle, Lecturer at the Rütli Agricultural School, Berne, considered that "breeding with a view to the increase of milk yield results in a secondary exhibit of fineness of fibre, and in consequence a decrease in the power of resistance," which necessitate increased care in their management.

A somewhat similar view was expressed by Mons. A. Molhant, of Louvain University, who considered that by such development "we open a wide field for the influence of external factors." Dr. Overbosch, Veterinary Surgeon of Gouda, considered that there is not sufficient exact knowledge to enable us to answer the question, and that "if we would answer this question on a statistical basis we must first endeavour to collect exact data," as Francis Galton did for his work on "Natural Heredity."

The next paper came from Professor J. Besnard, of Chili, who put forward this novel explanation for what is supposed to be the susceptibility of heavy milking cows to tuberculosis. "It is not because cows have passed through numerous periods of lactation with abundant flow that they often become tuberculous, but because they have been kept too long in infected surroundings." Apart from this he considers that a selective breeding of cows with a view to increasing the quantity and quality of milk may be carried on without fear of injury to the animals themselves or their young.

Dr. Charles Douglas, of Scotland, in a valuable paper drew attention to several of the points above mentioned. He considered the great strain upon an animal consequent on large milk production necessitated special care as to both proper and sufficient feeding, and in every respect which might affect the health of the animal. He, too, considered the production of a calf every year far too great a strain upon such an animal until after the third calf.

A paper by Professor Pucci added little to our knowledge of the subject. Mons. Lucas, director of a French agricultural station, considers that no harm results provided that breeders take into consideration not merely milk production but the form and build of the animals, so as to ensure perfect health and vigour.

The general Report on this question was presented by Professor Dr. J. V. Duerst, of the University of Berne, who gave some figures which go to show that in Switzerland cows with large milk yields are more prone to tuberculosis than those with smaller yields. But the percentage of tuberculous cows in the country is so high that we cannot help thinking the cause is to be found in climatic conditions, food supply, and methods of housing quite as much as in the higher yield of milk.

## SECTION II.—CHEMISTRY AND BACTERIOLOGY.

*Third Subject*—Uniform methods for the analysis of cheese.

Modern science appears to me to have become hair-splitting. Attempts are made to obtain methods which give scrupulously accurate results, but such methods are of little use if the material they are to be employed upon is one of which no two samples can be obtained exactly alike. Cheese is essentially such a substance. Hence to adopt an elaborate method for determining the water in cheese when simple methods with the same amount of care bestowed upon them give quite as accurate results seems to me folly and not science.

Some time ago Professor Dr. C. Mai, of Munich, brought out a method for the estimation of water in cheese by distilling it with petroleum of special boiling point into a graduated tube and subsequently measuring the amount of water in the tube. Such methods may be good for the inventor of the special apparatus required, for the manufacturer of the apparatus and for the vendor of the special petroleum used. I do not think they are good for anything else.

The first paper was by Professor Mai. The authors of the other papers, five in all, seemed to be of my way of thinking. A most interesting and valuable paper was presented by Professor Weigmann and E. Haglaud, of the Kiel Dairy Experiment Station, which was based on a large amount of work, and contains statistics that will be of value apart from the criticism of Mai's method, which is its main object. The Study-Commission of the International Dairy Federation presented a report on the methods considered best for the estimation of water and fat in cheese. It was interesting to me to note that the methods recommended were those which had been adopted during my investigations into the manufacture of Cheddar Cheese from 1891 to 1898.

*Fourth Subject.*—Lactic Acid Bacteria and their utilization in the Dairy Industry.

No less than nine papers were contributed on this subject, among the writers being some of the greatest authorities on dairy bacteriology. Most of the papers were of a purely scientific character and dealt with the varieties of lactic acid bacteria found in cheese.

It is not necessary to detail here those papers which dealt with the nomenclature and classification of bacteria, but I think all will agree with the suggestion of Dr. Orla-Jensen, of Copenhagen, that in naming bacteria it is desirable "to choose, whenever it is possible, such names as suggest something really characteristic of the definite microbe in question, and not to give names of persons as generics."

Professor Gorini, of Milan, and others in looking at the subject from a practical point of view laid special stress upon the fact that merely by "the employment of the lactic acid bacillus (pure cultures) we cannot achieve the desired results" unless "hygienic rules are strictly observed in milking and dairy work."

He incidentally made one or two suggestions that deserve consideration, viz., that boiled whey should be used for propagating bacteria; that the best temperature for the rapid development of a good ferment is about 95 deg. F., and that the whey should be kept at this temperature until it reaches an acidity of from 0.45 to 0.65 per cent. lactic acid.

In relation to this question of clean milk, the Director of the Government Dairy Station at Petrograd, S. Paraschtschuk, made the following remarkable statement:—

"In bad milk, that is in milk kept in unfavourable circumstances, some of the lactic acid bacteria do not propagate satisfactorily. In my opinion, harmful matter collects in such milk—hinders the development of the finer species of lactic acid bacteria, even to the extent of annihilation, and causes very powerful degeneration of the more resistant kinds."

Dr. Orla-Jensen, commenting hereon, says:—"If this assertion can be proved we have here the key to many a riddle."

A valuable report by Alice C. Evans and E. G. Hastings on the work done at the University of Wisconsin, U.S.A., was of a more practical character. It dealt mainly with the rôle of lactic-acid-forming bacteria in the making and ripening of Cheddar cheese, and contains this remarkable statement as the result of the work they have done. "In all 14 varieties of cheese organisms were found in sufficiently large numbers to be considered influential in cheese ripening."

All the papers contributed made it perfectly clear that there are many organisms at work, or capable of working, in the production of acidity and in the ripening of cheese, and the whole of the information given lent emphasis to the following paragraph in a paper contributed by O. Gratz, President of the Dairy Experiment Station of Magyarovar (Hungary):—

"Even if we know already a good deal about the part played by lactic acid bacteria in the process of ripening cheese, we know but little of the proper ways and means of employment of the different kinds. For the present usual addition of a certain fixed quantity of either one or the other lactic acid microbe does not attain the ideal we aim at, namely, the addition of certain specified microbes for certain forms of cheese. We should not content ourselves with this addition only, but also understand how to direct and keep the fermentation caused by this addition on the right track."

Professor Orla-Jensen, after summarising the various reports, concludes as follows:—

"The differences of opinion on the cheese question which raged ten years ago have now been calmed down, and those held by that great Swiss authority, Dr. von Freudenreich, are, with small modifications universally accepted. For us others there remains, however, more than work enough, and I believe we should more rapidly reach the goal if the various Dairy Institutions would, on the one hand, specialise more intensely, and would on the other more freely co-operate."

"As almost all the bacteria we at present know differentiate, on being studied, into innumerable varieties, it would be desirable if each laboratory and station would choose one small group for specialisation, and study this group in its minutest detail. Everyone who experiments with any particular microbe would then also know where to turn for pure cultures with vital powers. For the individual it is impossible to breed all the different micro-organisms of the dairy. Not only in itself is this work too lengthy, but each group demands special knowledge and experience. As it is with the gardener so it is with the bacteriologist. He who knows how to grow roses and succeeds in this, is not necessarily as successful for that reason with orchids.

"I would emphasise the hope that our International Congresses may also lead to international co-operation in the domain of bacteriology."

### SECTION III.—DAIRY ECONOMICS.

*Fifth Subject*.—The rational use of the bye-products of the Dairy.

As A. P. Hansen, of Copenhagen, Government Dairy Adviser, suggested, there are five bye-products to be considered:—1, Skim Milk; 2, Butter Milk; 3, Whey; 4, Rinsing Water and Refuse Milk; 5, Waste Water from the Dairy Buildings. Of these 4 and 5 are always refuse products, and 2 and 3 are so at times. The utilisation and disposal of these substances is certainly one of the modern problems of the dairy industry, which I fear the papers read at the Congress did not go far to solve. However, the following suggestions were made:—

*Skim Milk*.—That its use as a beverage should be more widely encouraged among the working classes is a suggestion that will meet with general approval. That this will be ensured by first condensing it, is, however, a moot point. Probably the enormous quantities of condensed skim milk now sold are used mainly for feeding infants and children, for whom it is certainly not suitable, while grown-up men and women, for whom it is suitable, probably do not consume it. Several attempts have been made to ferment skim milk or to convert it into a species of milk-lemonade, and it is stated that the consumption of this milk-lemonade is "rapidly developing in Switzerland."

The principal trade product obtained from skim milk is Casein. When prepared with certain alkaline salts it is known as "Nutritive Casein," and

sold as Caseon. Nutrose, Eulactol, Sanatogen, Globon, Eucascin, &c. Ordinarily it is employed for technical purposes. It is made into imitation ivory (Lactite), into imitation celluloid or horn (Galalith), is used for mixing with paints, and also as a glue. In this latter respect M. C. Pelichet of Moudon, in his General Report on the section says: "it has been used with very good results for putting together pieces of carpenter's work." Mons. Arm. Collard Bovy, General Secretary of the International Dairy Federation, considers that "in time there will be a very great demand for this product."

*Whey.*—Apart from well-known methods of utilising it A. P. Hansen suggests that it should be "put through a separator, the cream allowed to get sour and then churned with new milk." A butter of very good quality will result, which can be sold fresh at almost the same price as ordinary good butter. Whey may be fermented and makes "a very agreeable alcoholic drink." It can be used for the production of milk sugar and lactic acid. But the demand for these substances is very limited, and for the most part whey, the world over, appears to be used for feeding pigs. Mons. Pelichet considered that "up to the present, in spite of the various methods of utilising dairy bye-products, the problem of their remunerative use had not yet been solved."

*Waste Water, &c.*—Only A. P. Hansen referred to the great problem of how to utilise, or perhaps one should say dispose of, these wastes. Unfortunately, he had no new suggestions to offer. He pointed out that septic tanks were not satisfactory owing to "the considerable amount of water, and the lime" hindering fermentation. On the other hand, where possible the waste may be used on a farm, in the way sewage is treated. He said "such fields yield excellent returns."

*Sixth Subject.*—The Milk Supply of Large Towns and its relation to Economic and Social Conditions.

Seven papers were contributed on this subject of which the most important came from the United States of America. Mr. Ernest Kelly, of the Department of Agriculture, Washington, pointed out what was done in America to ensure a satisfactory milk supply. Three classes of milk are sold. These are:—

1. Certified milk, which "is raw milk of exceptional purity, produced under the supervision of a Commission appointed by a medical society." This milk must contain no pathogenic bacteria, and must not exceed 10,000 bacteria per cubic centimetre

2. Inspected milk. In general it is raw milk from healthy cows and contains less than 100,000 bacteria per cubic centimetre.

3. Ordinary milk.

As regards prices, he stated that certified milk costs about 8d. a quart, inspected milk about 1d. or 1½d. a quart more than ordinary milk, and that milk producers receive on an average about 8d. a gallon for milk. "In the larger cities most of the milk sold retail is bottled." Some cities make this compulsory. "Statistics obtained in 1912 show that in the cities reporting 64·7 per cent. of all milk was bottled." He drew attention to the amount of machinery which this entailed both for bottling and for cleaning the bottles, also that "the waste in the distribution of milk is enormous." In the City of Washington 200 delivery waggons, each travelling 19 miles, cover in all 3,800 miles a day, though the streets in the city only total 581 miles. In spite of the advance made in America he considered: "there is need for much further work in educating mothers concerning the care of milk in the home. Much good milk is made dangerous by neglect and ill-treatment after its delivery."

S. Henry Ayers, Bacteriologist, Washington, contributed a paper on the Pasteurization of Milk, which custom has rapidly increased in the United States of late years. He stated that "there are three processes of Pasteuriza-

tion practised." One is known as the "flash" process, and consists in heating the milk rapidly to a temperature of 160° F. for 30 seconds to one minute, and then cooling quickly. The second is the "holder" process. The milk is heated to 140° up to 150° F. and kept at this temperature for 30 minutes, after which it is cooled rapidly. The third is Pasteurization in bottle. The raw milk is placed in bottles with water-tight seal caps, these are immersed in water heated to 145° F., and cooled gradually to 50° F.

The author is a firm believer in Pasteurization, and considers "the fallacy of the objections has been shown."

Dr. R. S. Breed, Bacteriologist at New York Experiment Station, contributed a paper, in which he pointed out "the serious defect" of certified milk, inasmuch as it cannot be sold for less than 8d. to 10d. a quart, while the price of ordinary milk is about one-half, 4d. to 5d. He stated that work at the New York Experiment Station has shown "that many of our farmers are producing a milk of an equally high grade under ordinary conditions and are selling it at the lower prices." Coming to the real theme of his paper, that "a great economic loss occurs because this milk cannot be quickly distinguished from milk of an inferior quality by any laboratory or other test," he suggested that the desired test may be found by utilising his method of counting bacteria in milk by the examination of a smear preparation (Cent. l. Bak. Abt. II, Bd. 30, p. 337).

The only other paper to which we need draw attention was one by Dr. A. Peter, Director of the Ruttli Dairy School. He looks at the subject from a very practical standpoint, and says:—"To produce a satisfactory hygienic milk by the application of refined methods of production and control at a price which only the well-to-do can afford is not satisfactory. It is far more desirable to organise the production of milk so that all classes of the population may use it. To ensure that more milk will be drunk it is essential that it be of good quality and cheap.

#### SECTION IV.—COMMERCE.

*Seventh Subject.*—On the percentage of fat in the dry matter of various cheeses which should be fixed as standards.

In Great Britain the majority of cheeses are made of whole milk. There are a few made from partly-skimmed milk. Abroad a far greater number of cheeses are made from milk which has had one-third, one-half, two-thirds, or even the greater part of its fat removed. To sell any of these cheeses under a name and for a cheese which has always been a whole milk cheese is a deliberate fraud. Far too much of this is going on to-day, hence the Federation is moving to have standards of fat in the dry matter of every cheese fixed. Before this can be done it is essential that the subject be most carefully investigated. On the one hand it would be a hardship to fix too high a standard, so that the maker of a genuine whole-milk cheese might suffer by his produce failing to come up to the standard. On the other hand, it would be probably a worse error to fix too low a standard. For that would open the door to a carefully sophisticated article being put on the market at a price which would compete with and so *lower the price generally* of the genuine article.

Eight papers were contributed on the subject by representative men, and various standards suggested for the cheeses which they had investigated. But the whole subject will have to come up again for consideration at the next Congress. So far little has been done to determine what these standards should be for British cheeses, and I would suggest that the question should be investigated by the chemists at the various agricultural institutions, each confining his attention to the special varieties of cheese made in his district,



and not merely for one month but for every month of the cheese-making season.

*Eighth Subject.*—What measures can be taken to suppress unfair competition in the cheese trade.

Three papers were contributed upon this delicate and difficult question. As may be supposed nothing definite was decided. But there seems to be a growing feeling that cheeses will sooner or later have to be stamped with a guarantee of such a nature as to enable fraudulent dealers to be detected and punished.

I cannot conclude this short epitome of the work done at the Sixth International Dairy Congress without expressing the hope that those who may take the trouble to read this report will show their further interest in the welfare of dairying by sending their names to Mr. Hardcastle as willing to join the British Section of the Federation under whose auspices the Congresses are held.

## THE INTERNATIONAL DAIRY CONGRESS IN BERNE, SWITZERLAND.

By S. R. WHITLEY, Rookwood, Shinfield, Reading.

THE nearest English equivalent of an International Dairy Congress is the annual conference held in different dairy districts by the British Dairy Farmers' Association, but the Congress of 1914 in Switzerland differed widely from any agricultural gathering yet held in the British Isles.

Eight hundred members, speaking many different languages and representing practically the whole dairy world, demand special arrangements and organisation for the transaction of business and for the reading of the necessary papers.

The first three days of the Congress, June 8th, 9th, and 10th, were devoted to the reading of papers and discussion thereon, which are dealt with in Mr. F. J. Lloyd's report.

The next six days were devoted to 12 different excursions, beginning with agricultural schools, laboratories, and factories in the immediate neighbourhood of Berne, and passing on to the longer excursions occupying from three to five days each.

As the number of members was so large, several of the excursions were run concurrently, and each member being given a list and full description was asked to put down his or her name for those he or she desired to attend. In this way the various parties were kept within manageable size, and every comfort and opportunity of seeing and learning was offered to the participants, but it was, of course, impossible for any one member to see all the objects of interest on the programme.

Perhaps the most interesting of the shorter excursions was the one to the Agricultural School at Rütli, only a few miles from the town of Berne. The school was founded in 1860 on an estate now belonging to the Berne State, and has 70 pupils taking a two years' course, and about 130 to 140 pupils who attend the school for 4½ winter months only for two consecutive years.

All the practical work of the farms is carried out by the students of the two years' course, and so theory and practice are well united. Each student pays £14 in the first year and £8 in the second year for his board and lodging. A Government subsidy of about £4,200 is received annually.

From 90 to 100 head of cattle of the pure Simmenthal breed are kept; the average annual yield of milk is about 910 gallons per head, with about 3·7 per cent. of butter fat.

The rotation of crops is an eight-year one, viz., winter wheat, potatoes, spring wheat or oats, followed by five years sown down to grass.

On this, as on most other Swiss farms, a special object of interest to the English visitors was the liquid-mauure cart, and the arrangements for its constant and economical use,

The milking cattle are largely stall-fed, and all the liquid manure is conducted to a huge concrete tank, which is so arranged that the cart can be rapidly filled by simply turning a tap. Whenever it rains, the liquid-manure cart is busy dressing the grass land, from which three or four cuts are taken during the year. It is not uncommon to enrich the liquid manure by the addition of superphosphate well mixed and dissolved in the tank itself. On how many farms in England is this cheap and efficient enrichment of the soil almost wholly neglected?

Close to the Agricultural School we found the Dairy School, where managers of the Swiss dairy industry are trained both in theory and in practice. The school is always full in winter with 40 pupils, but rather a smaller number attend in summer; the course of instruction is free of cost to the pupil, but board and lodging cost him about £16 per annum. The work of a complete cheese-dairy is carried out, and about 300 head of swine were in process of fattening. M. Albin Peter, the genial President of the Congress's Organisation Committee, who was indefatigable in helping and guiding the various parties throughout the Congress, is the present director of this Dairy School.

Fifteen minutes' walk brought us to the buildings of the Swiss Company for exportation of Emmenthaler cheese at Zollikofen.

This society, with premises close to the railway, was started in 1911 by the various Swiss societies for the production of milk; its purpose is to collect, store, and export the cheeses made by its members. It can easily store 8,000 of the large Emmenthaler cheeses. It has an office in Paris and representatives at all the large centres of consumption in Europe. Last year's turnover amounted to about £360,000.

The next excursion was arranged for the afternoon, so that members of the Congress might spend a profitable morning in the Swiss National Exhibition at Berne, a truly marvellous and beautiful exhibition of all the various activities of Swiss national life and commerce. A large part of the exhibition was devoted to agriculture and its allied industries.

Judging by the large number of school children being conducted round the exhibition, and having objects of interest carefully explained to them by their teachers, it appeared as if this were an integral part of the education of all the village schools, as it is in most parts of the Continent.

The drive round Berne and its environments was much enjoyed, and the typical cheese factory at Meikirch was very instructive, while our hosts and hostesses at Meikirch, where we partook of light refreshment, added to our pleasure by waiting on us in their national dress.

A trip through the Bernese Oberland to Brünig, Lucerne, and up the Rigi occupied the next five days. We were a party of 126, led by Herr Prof. Dr. Burri, President of the Committee which so ably arranged the work of the Congress and head of the research station at Liebfeld. He and his lieutenant did all that was possible for the large party's comfort and instruction, and all the members felt that they owed to them a debt of gratitude which it would be difficult to repay.

Leaving Berne by train early in the morning, we were soon at Thun, where the Berna Milk Company very kindly showed us their factory for the production of condensed milk and milk powder. The machinery and general organisation of this large factory, capable of dealing with enormous quantities of milk, were of great interest. A short walk brought us on to M. Grossniklaus' farm, where for the first time we saw a very fine herd of Simmenthaler cattle grazing on a field; up to that moment all the cattle we had inspected had been stall-fed. In the cow byres was found a one-legged milk stool, quaintly carved, evidently by its owner, and fitted with a strap for attachment to the milker's body, a practical arrangement leaving both his hands free at all times.

M. Grossniklaus keeps from 80 to 100 head of cattle and 6 bulls, which are grazed from May 25th onwards on the military training ground quite close to the town of Thun, for which rent is paid at the rates of about 48s. per cow, 40s. per heifer, and 25s. per calf. We walked through the picturesque town to the lake side, where the Thunerhof Hotel provided us with a sumptuous lunch. The wet weather somewhat marred our steamer trip up the lake to Interlaken, but fine glimpses of the encircling mountains helped us to imagine something of the beauty of this district, the Riviera of Switzerland.

Interlaken, nestling at the foot of the Jungfrau, is world-famed and needs no description at my hands. The authorities of the Kursaal welcomed our party by giving each member free entry for the evening, where the music and other entertainments were much enjoyed.

The next day should have been the red-letter day of the whole excursion—the ascent of the Jungfrau—but clouds and mist obscured our best views, though no one will ever forget the experience of being over 10,000 feet up and right in the midst of the eternal snows.

Ascending by the romantic Lütchen Valley to Lauterbrunnen and getting fine views of Wengen and the Wengernalp, tunnelling right through the rock for the last 3,000 feet or more, we came out at the Jungfraujoch, the highest station in Europe, right in the midst of the great glacier, and from which we should have ascended further with the aid of guides, but the weather would not permit of the adventure, and we returned via Grindelwald to Interlaken and thence by the lake of Brienz to Meiringen.

On Sunday morning the party visited the Aar gorge, where the river Aar cuts its passage through the mountains in a rocky ravine so narrow and steep that the footpath consists mostly of tunnels and galleries hung on the face of the vast rocks.

Leaving Meiringen by the train over the Brünig Pass, the superb views of the valley of the Aar, with Brienz and Interlaken in the distance, were enjoyed by all. We reached Lucerne for lunch, and then were invited to inspect the premises of the Lucerne Co-operative Dairy. This well-ordered factory was opened in 1907 with a daily milk supply of about 700 gallons, and is now dealing with about 2,000 gallons. Its root principle was a new one to most of the English visitors, in so far as it is a co-operative effort of the milk consumers to

obtain a perfectly clean milk supply for the town. It supplies large quantities of butter, cheese, cream, kephir, zoghourt, baby's milk, and milk pasteurized according to Dr. Gerber's method. The milk is bought from a great number of small farmers, and regular inspections of the various farms and herds are made on behalf of the society by trained agriculturists, the veterinary surgeon being called in only where necessary. The concern is undoubtedly a great success, and the farmers are evidently fairly treated and encouraged to supply milk of the highest quality.

After a thorough inspection of this interesting and up-to-date dairy we had time to visit the beautiful old covered bridge, and the Lucerne lion, carved, after a model by Thorwaldsen, in the solid rock, to the memory of the brave Swiss soldiers who fell in 1792 when defending the Tuileries in Paris.

Early next morning the party left Lucerne by steamer for Vitznau, whence the ascent of the famous Rigi is made by means of the mountain railway.

After enjoying magnificent views of the lake and the mountains, with lunch in the hotel at the summit, the party began to descend on foot in order to visit the fine herd of cattle of the Schwyz breed belonging to M. Burgi-Gretener.

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The milking cattle are largely stall-fed, and all the liquid manure is conducted to a huge concrete tank, which is so arranged that the cart can be rapidly filled by simply turning a tap. Whenever it rains, the liquid-manure cart is busy dressing the grass land, from which three or four cuts are taken during the year. It is not uncommon to enrich the liquid manure by the addition of superphosphate well mixed and dissolved in the tank itself. On how many farms in England is this cheap and efficient enrichment of the soil almost wholly neglected?

Close to the Agricultural School we found the Dairy School, where managers of the Swiss dairy industry are trained both in theory and in practice. The school is always full in winter with 40 pupils, but rather a smaller number attend in summer; the course of instruction is free of cost to the pupil, but board and lodging cost him about £16 per annum. The work of a complete cheese-dairy is carried out, and about 300 head of swine were in process of fattening. M. Albin Peter, the genial President of the Congress's Organisation Committee, who was indefatigable in helping and guiding the various parties throughout the Congress, is the present director of this Dairy School.

Fifteen minutes' walk brought us to the buildings of the Swiss Company for exportation of Emmenthaler cheese at Zollikofen.

This society, with premises close to the railway, was started in 1911 by the various Swiss societies for the production of milk; its purpose is to collect, store, and export the cheeses made by its members. It can easily store 8,000 of the large Emmenthaler cheeses. It has an office in Paris and representatives at all the large centres of consumption in Europe. Last year's turnover amounted to about £360,000.

The next excursion was arranged for the afternoon, so that members of the Congress might spend a profitable morning in the Swiss National Exhibition at Berne, a truly marvellous and beautiful exhibition of all the various activities of Swiss national life and commerce. A large part of the exhibition was devoted to agriculture and its allied industries.

Judging by the large number of school children being conducted round the exhibition, and having objects of interest carefully explained to them by their teachers, it appeared as if this were an integral part of the education of all the village schools, as it is in most parts of the Continent.

The drive round Berne and its environments was much enjoyed, and the typical cheese factory at Meikirch was very instructive, while our hosts and hostesses at Meikirch, where we partook of light refreshment, added to our pleasure by waiting on us in their national dress.

A trip through the Bernese Oberland to Brünig, Lucerne, and up the Rigi occupied the next five days. We were a party of 126, led by Herr Prof. Dr. Burri, President of the Committee which so ably arranged the work of the Congress and head of the research station at Liebefeld. He and his lieutenant did all that was possible for the large party's comfort and instruction, and all the members felt that they owed to them a debt of gratitude which it would be difficult to repay.

Leaving Berne by train early in the morning, we were soon at Thun, where the Berna Milk Company very kindly showed us their factory for the production of condensed milk and milk powder. The machinery and general organisation of this large factory, capable of dealing with enormous quantities of milk, were of great interest. A short walk brought us on to M. Grossniklaus' farm, where for the first time we saw a very fine herd of Simmenthaler cattle grazing on a field; up to that moment all the cattle we had inspected had been stall-fed. In the cow byres was found a one-legged milk stool, quaintly carved, evidently by its owner, and fitted with a strap for attachment to the milker's body, a practical arrangement leaving both his hands free at all times.

M. Grossniklaus keeps from 80 to 100 head of cattle and 6 bulls, which are grazed from May 25th onwards on the military training ground quite close to the town of Thun, for which rent is paid at the rates of about 48s. per cow, 40s. per heifer, and 25s. per calf. We walked through the picturesque town to the lake side, where the Thunerhof Hotel provided us with a sumptuous lunch. The wet weather somewhat marred our steamer trip up the lake to Interlaken, but fine glimpses of the encircling mountains helped us to imagine something of the beauty of this district, the Riviera of Switzerland.

Interlaken, nestling at the foot of the Jungfrau, is world-famed and needs no description at my hands. The authorities of the Kursaal welcomed our party by giving each member free entry for the evening, where the music and other entertainments were much enjoyed.

The next day should have been the red-letter day of the whole excursion—the ascent of the Jungfrau—but clouds and mist obscured our best views, though no one will ever forget the experience of being over 10,000 feet up and right in the midst of the eternal snows.

Ascending by the romantic Lütchen Valley to Lauterbrunnen and getting fine views of Wengen and the Wengernalp, tunnelling right through the rock for the last 3,000 feet or more, we came out at the Jungfrauoch, the highest station in Europe, right in the midst of the great glacier, and from which we should have ascended further with the aid of guides, but the weather would not permit of the adventure, and we returned via Grindelwald to Interlaken and thence by the lake of Brienz to Meiringen.

On Sunday morning the party visited the Aar gorge, where the river Aar cuts its passage through the mountains in a rocky ravine so narrow and steep that the footpath consists mostly of tunnels and galleries hung on the face of the vast rocks.

Leaving Meiringen by the train over the Brünig Pass, the superb views of the valley of the Aar, with Brienz and Interlaken in the distance, were enjoyed by all. We reached Lucerne for lunch, and then were invited to inspect the premises of the Lucerne Co-operative Dairy. This well-ordered factory was opened in 1907 with a daily milk supply of about 700 gallons, and is now dealing with about 2,000 gallons. Its root principle was a new one to most of the English visitors, in so far as it is a co-operative effort of the milk consumers to

obtain a perfectly clean milk supply for the town. It supplies large quantities of butter, cheese, cream, kephir, zoghourt, baby's milk, and milk pasteurized according to Dr. Gerber's method. The milk is bought from a great number of small farmers, and regular inspections of the various farms and herds are made on behalf of the society by trained agriculturists, the veterinary surgeon being called in only where necessary. The concern is undoubtedly a great success, and the farmers are evidently fairly treated and encouraged to supply milk of the highest quality.

After a thorough inspection of this interesting and up-to-date dairy we had time to visit the beautiful old covered bridge, and the Lucerne lion, carved, after a model by Thorwaldsen, in the solid rock, to the memory of the brave Swiss soldiers who fell in 1792 when defending the Tuileries in Paris.

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The first organised function was dinner at the Rougemont Hotel, at 7 o'clock, at which Mr. S. Palgrave Page presided. We were honoured by the Mayor and Mayoress of Exeter (Mr. and Mrs. Kendall King), the Sheriff of Exeter (Dr. Shirley Steele Perkins), the Town Clerk (Mr. Lloyd Parry), Professor Walter J. Harte, Mr. H. Holman, J.P., and Mrs. Holman, Mr. J. J. Nicholls (Dawlish), Mr. J. Dolbear (Newton Abbot), and several other gentlemen interested in dairy work in the neighbourhood.

The toast list was short, the President proposing the "Mayor and Corporation of Exeter," to which the Mayor responded, and in a few well-chosen words welcomed the members to Devon. He then proposed "Success to the British Dairy Farmers' Association"; to this Mr. W. J. Grant replied.

At 8.30 p.m. a reception was held at the Guildhall. The guests were received by the Mayor and Mayoress, accompanied by the Sheriff (Dr. Steele Perkins) and Mrs. Steele Perkins.

The ancient Guildhall was most effectively decorated, and presented a very picturesque appearance. Music was discoursed by a string band occupying the aldermanic benches. Many of the ancient relics having reference to various phases of civic life were on view and created much interest, and a most interesting address was given by the Town Clerk (Mr. H. Lloyd Parry), who fully explained the history of the city, and amongst other things informed us that a former occupant of his office, whose portrait appeared on the walls, was so honoured principally because he had been instrumental in getting the tax taken off cider in his day. One thing that many of us noticed for the first time was the very pretty chain of office worn by the Mayoress.

Light refreshments were kindly dispensed in the Mayor's parlour, and a vote of thanks to the Mayor and Mayoress, proposed by Mr. S. R. Whitley and responded to by the Mayor, brought our first pleasant evening to a close.

The next morning, Sunday, May 17th, was all that could be desired. After breakfast, visits were paid to various places of interest in the city, especially the Rougemont Gardens, a public pleasure ground surrounding the Rougemont Castle, where the wealth of bloom delighted the eyes of our friends from the cold north. The portion of these grounds that used to be the fosse of the castle is notable for its rare and beautiful trees. Many visited the cathedral. Eleven o'clock soon came, and at this hour the first of the four G.W.R. motor chais-à-bancs that were to convey us on our trip was due to take those of the party more particularly interested in poultry and pigeons to Brookfield Pinhoe, the residence of Mr. W. H. Edwards, a fancier who has chosen a lovely spot for his hobby. The members were welcomed by Mr. and Mrs. Edwards, and shown over the various departments of this model farm. The arrangement of the poultry runs came in for great praise, and some excellent specimens of various birds were seen; also the lovers of pigeons had many well-known to prizewinners to admire. Special features on this farm are the utility pigs, a cross of Large Black and Middle White York, and the South Devon and Jersey cows.

The kennels came in for much admiration, the fox terriers and cockers, which have won several premier prizes at the principal dog shows of the country, being objects of particular interest, especially Monkerton Charlie, the winner of four first prizes at the Crystal Palace. Of the gardens one visitor was heard to remark: "Well, there is nothing in the North to touch this for beauty." The greenhouses were also inspected, with their wealth of flowers and delicious fruit, and the visitors were eloquent in their commendation of the adaptability of the farm and the dexterous systems introduced

into its management. After Mr. Caddick had expressed the thanks of the party for Mr. and Mrs. Edwards' kindness, a move was made for our *char-à-banc*, and the others, which were to leave Exeter an hour later, having arrived—except a few of the more devout members of the party who could not conveniently leave the service at the cathedral, so had to motor out—the next move was Poltimore Park, the beautiful residence of Lord and Lady Poltimore.

The park was looking delightful, being bathed in sunshine, while the deer, of which there seemed to be an endless number, attracted no little attention. On arrival at the house, the guests were heartily greeted by Lord and Lady Poltimore, who were assisted in this pleasant task by Hon. G. Bampfylde, Major the Hon. Edward Beaumont, Mr. R. L. Riccard (agent), and Mr. A. H. Fry (farm manager). A stroll in the grounds preceded luncheon, which was served in a room on the walls of which were hung paintings of many ancestors of the present Baron. Following lunch, a photograph of the party was taken; then a move was made to the dairy, where everything was spick and span, and the butter, Devonshire clotted cream, and junkets looked delicious. To a large number of the party this was their first lesson in the mysteries of the preparation of Devonshire clotted cream. Next the Jersey cows came in for inspection and general praise, the show cards above the various stalls testifying to the prominent place taken by his Lordship's exhibits at the leading agricultural exhibitions.

A very choice herd of milking Devons is also kept, and we heard a good deal about a noted bull that had just been bought for 100 guineas, but was at present at his Lordship's estate at North Molton. This bull is available for the use of tenants on the estate and great hopes were being expressed of a successful show career for this animal; this hope, I am pleased to say, has since been fully realised.

From the cattle we moved on to the stables to see the splendid lot of Shire horses for which the Poltimore stud is noted, his Lordship having purchased several of the best horses at all the principal sales for some years past. Next, the kennels were inspected. After this a visit was paid to the extensive gardens and greenhouses, where the time was very pleasantly passed in admiring the beautiful blooms and trees: special interest was attached to a very ancient cork tree, which, I believe, was brought to Poltimore by Sir Walter Raleigh; the birds of all kinds, parrots, cockatoos, &c., the colours of which were magnificent. Words fail me to express by any means adequately the delights of the grounds, and it was truly expressed by many of our party, "England owes much to our noblemen such as Lord Poltimore for the good they do in any neighbourhood," where they assist in breeding the best of stock and assist their tenants and neighbours by keeping for their use the best sires to be obtained, and last, but not least, by showing what can be done by the employment of labour to keep up such beautiful grounds, which add to the enjoyment of life. Time passed all too quickly, and the order was given to move for tea, to which we were entertained by his Lordship.

After this a hearty vote of thanks to Lord and Lady Poltimore, who had come from London on purpose to entertain the party, and to all the members of the house party who had assisted in explaining the various beauties of the place, was moved by Mr. John Welford, J.P.

Lord Poltimore, in replying, expressed the pleasure it had given him to entertain the party, and the hope that at some future time he might have



the pleasure of again entertaining the Conference party should they visit Devonshire.

The motors were then boarded, and with ringing cheers a start was made via Broadclyst and Honiton's Clyst to Exeter in time for dinner, the unanimous opinion being that this was one of the pleasantest Sundays ever spent by the B.D.F.A. Conference.

*Monday, May 17th.*—After breakfast at 8.30, another stroll around Exeter in glorious sunshine until 10 o'clock, when we met at the Guildhall for the first real business of the Conference, papers being read:—

- (1) Farming in England in Early Times. (Professor Walter J. Harte, of the University College, Exeter.) (See page 85.)

An interesting discussion followed, Mr. W. J. Grant, Mr. Chas. Robinson, Mr. John Porter, Mr. E. G. F. Walker, and Mr. J. T. H. Farmer taking part.

- (2) The Modern Cow-house. (Mr. G. Titus Barham, Sudbury, Middlesex.) (See page 93.)

Mr. John Welford, J.P., Mr. Sidney Villar, F.R.C.V.S., Mr. Robert Shepherd, Mr. W. P. Gilmour, Mr. A. G. Nye, Mr. Clement C. Smith, and Mr. John Porter took part in the discussion.

After lunch the party again boarded the motors and drove through some lovely country scenery about seven miles to Rosamundford, the residence and farms of Messrs. A. & T. Loram, of the Cathedral Dairy, Exeter. The drive was one of continual delight. The luxuriance of the vegetation, the varying pastoral scenes, and the glorious weather all contributed to make it memorable. The scarcity of arable land in the district would be condemned in some quarters, but it was admitted that the pastures were remarkably good, though the visitors from the North of England and Scotland did not approve of the presence of so many buttercups in the pastures. The irregular shape of the fields and the width and height of the hedges appeared very strange to many of the party, especially in places where the road was very narrow and the hedges took about 10 feet of land on either side—a waste of good land and a splendid harbour for vermin. The red soil was a novel feature to most of the party.

Arriving at Rosamundford we were met by our hosts and shown the extensive herds of North Devon cows. It is generally considered that the North Devon cattle are only useful for the production of the very best beef, and that their milking qualities are very inferior. A study of the very fine lot of cows we saw proved this idea to be erroneous, and that it is quite possible by judicious breeding to combine both milk and beef production. The bulls in use were "General," bred by Lord Clinton, an animal of exceptional size, and bred from a remarkably good milking strain, and a young one bred by Mr. Tribble, whose dam gave 50 lbs. of milk daily for a considerable time, and was afterwards exported to South Africa and won a Championship at Port Elizabeth. The hope was expressed by Mr. A. T. Loram that a class would be given in the near future at the Dairy Show for North Devons, and, if this is done, no doubt some from this breed would give a good account of themselves, as we saw several animals that had given the exceptional quantity of 1,000 gallons in one year, containing 3.75 per cent. butter-fat, one of which subsequently took first prize for Milking Devons at the Royal Show. The Jersey herd attached to the creamery contained some excellent specimens of the breed.

The real treat of the afternoon was the inspection of the creamery. There we saw no less than 300 pans, each containing from 7 to 8 quarts of milk in various stages in the process of the manufacture of Devonshire clotted cream. The milk is taken directly from the cow and placed in aluminium pans, where it is allowed to cool naturally, this taking 12 hours; it is then scalded to 180 deg. F. for 17 to 20 minutes, and is then allowed to cool naturally. The cream forms a solid layer on the top, and the skim milk which is left contains about 1 per cent. of butter-fat, and is fed to pigs and calves or sold in Exeter. We were informed that seven-eighths of a pound of cream was obtained from 1 gallon of milk. It is the opinion of the writer that this quantity is only to be obtained from Jersey or other Channel Island cows, and that from half a pound to three-quarters would be quite a full quantity for average cows.

There was also a thoroughly well filled up curing room for bacon; also we had evidence that fruit bottling was carried on on rather an extensive scale.

Going through the pastures many of us were surprised to see how well the farmyard manure was spread, and, on inquiry, found that it was done with a manure distributor that could easily be attached to the ordinary carts, the cost of which, we were informed, was £14 10s. It was certainly most efficient and a great labour saver. The opinion expressed by most of the agricultural members of the party was that this was the best implement for the purpose they had ever seen. A move was next made to the lawn in front of the very pretty house, where tea was laid on little tables under the shade of the magnificent trees. Here we were joined by Lord Clinton, the Mayor and Mayoress of Exeter, the Sheriff and Mrs. Steele Perkins, and many others. Tea over, the party assembled on the lawn, when a photograph was taken of the group.

Mr. G. Titus Barham, on behalf of the Association, moved a vote of thanks to Messrs. Loram and their wives for their kindness, and expressed his approval of the arrangements on the farm.

Mr. A. T. Loram briefly replied, and in doing so strongly advised the Association to use their influence and get the members to keep milk records.

The party then returned to Exeter by the same route, where they saw Messrs. Loram's city premises, which are managed on the most scientific and hygienic lines. Numbers of tins of cream were sent off by members of the party to those who could not be with us.

After dinner at the hotels many of us accepted the invitation of the manager of the Hippodrome to see the performance, seats being reserved for us.

*Tuesday, May 19th.*—Breakfast at seven o'clock. Eight o'clock finds us again on the motors for a long day. We bid "good-bye" to the city, and under a cloudless sky, with the sun in full force, wend our way to Kenton. The drive takes us through some characteristic Devonshire villages to our first place of call, Mr. Beer's, at Willsworthy. Here we had the pleasure of seeing a typical commercial Devonshire farm; the object this morning being to visit some farms of the rent-paying sort. In a field near the house Mr. Beer's herd was inspected. It consisted of a good mixed herd, some of them evidently good milkers. The party appeared greatly interested, and asked many questions of their genial host. Time passed all too quickly, and before the ladies had drunk a cup of tea and the gentlemen sampled Mr. Beer's cider, it was evident we should be reluctantly compelled to omit a call at Messrs.

Sherwell's Newhouse Farm, and go direct to Manhead Park, the residence of Sir Robert Newman, Bart., who had kindly invited us to inspect his mansion, grounds, and pictures. The drive through the Park was delicious under the shady trees away from the blazing sun. In addition to the tropical vegetable wonders in the grounds, we had the opportunity of seeing some priceless Dresden china, old pictures, and good collections both entomological and of rare birds. In the library was a fine collection of rare books. From the tower adjoining was secured a splendid view of the estuary. On the Channel some of His Majesty's battleships lay sinister and silent, and to some eyes marred the otherwise perfect scene. Again the whistle calls us to the motors, and we are off again, this time down to Starcross and on to Easton Farm, where, at the invitation of Mr. J. J. Nicholls, his farm stock was inspected. This consisted of a nice herd of pure-bred South Devons, true specimens of the breed. Mrs. Nicholls kindly invited us to inspect her dairy and the milk-scalding apparatus, to show the party how the production of clotted cream is carried on in the average farmhouse. We then moved on *via* Dawlish, a town famed for its literary associations, along the sea coast to Teignmouth and Newton Abbot, where we were met at the Globe Hotel by Mr. Herbert Holman, J.P. (who was kindly entertaining the party to lunch), Mrs. Holman, Mr. R. Vicary, J.P., and a large party of local friends.

At the conclusion of the lunch Mr. Robert Vicary proposed "Success to the B.D.F.A.," and spoke in terms of praise of the work of the Association. In conclusion he put in a word for the good old Devonshire cream, expressing the hope that it would not be improved off the face of the earth.

Mr. W. J. Grant proposed "Our Host" in felicitous terms, to which Mr. Holman replied.

On leaving Newton Abbot hearty cheers were given for Mr. and Mrs. Holman, and we made our way over smiling hills and through lovely valleys to Totnes, where the Annual Show of the Devon County Agricultural Association was taking place. At the kind invitation of the Council the members of our party visited the Show. Many of our members saw for the first time the three breeds of sheep which are principally kept in the county, *viz.*, Devon Longwool, South Devon, and Dartmoor.

Special interest attached to the cows, as the B.D.F.A. Gold Medal was given for the best Dairy Cow or Heifer of the North or South Devon breed or type. This was won with a milky-looking South Devon with a three-days-old calf at her feet, the property of Messrs. Whitley. The Mayor of Totnes (Edward Windeatt, Esq., J.P.) kindly entertained us to tea on the showground, after which he kindly took us through the ancient Church and Guildhall, explaining various interesting relics. We were also conducted by the most efficient manager over the West of England Bacon Company's Model Factory. This visit was both interesting and very instructive.

We next mounted our buses and set off for our night's residence in Torquay. The drive through Paignton and along the coast in the cool of the evening after a very hot day was delightfully refreshing, and great were the expressions of admiration when Torquay came in sight in the full beauty of the setting sun. As we left Paignton with Tor Bay and Brixham on our right, Torquay in front, and beautifully wooded country on the left, it was a sight not often equalled and never excelled in the British Isles. After dinner at our hotels we are off again, as we are due at the Pavilion at 8.30 p.m., where a reception is being given by the Mayor of Torquay in our honour, and a concert to follow. Some of the parts given in the Devonshire dialect came in for

tumultuous applause. Most of us were glad to reach our hotels and bed about midnight.

*Wednesday, May 20th.*—Breakfast at 7.30, as the motors are due at 8.30 to take us *via* Newton Abbot to Messrs. Henley's Cider Factory at Abbotskerswell. We were shown over the factory by Mr. Lang, the courteous manager, who explained the process of cider making. After a short but very interesting stay, during which we sampled some of the noted cider, we were off again, this time for Newton Abbot market, where we found much to interest us—some in the Butter Market, others with the cattle and sheep—and all the ladies and most of the gentlemen accepted the kind invitation of Mr. and Mrs. John Dolbear to inspect their dairy and premises. This, though not so large as some we had seen, was the admiration of all who saw it, and loud were the praises of those who accepted the host's invitation not only to inspect, but to sample—and after a couple of hours' dusty drive this was highly appreciated. Our next move is to the Alexandra Hall, where, at 11.30 a.m., a Conference is held under the Chairmanship of Major Harold St. Maur, J.P., D.L., C.C. Papers were read by Mr. Bernard N. Wale, B.Sc., Principal of Seale Hayne College, on "The Rearing of Calves on Substitutes for Milk-fat and Milk," and by Mr. H. J. Hannaford, Farm Bailiff to Messrs. W. and H. Whitley, on "South Devon Cattle as a dual-purpose breed." There was a good attendance of the local agriculturists and members. Unfortunately time would not permit of a full discussion on these most interesting papers, the readers of which were heartily thanked on the motion of Mr. Porter and Mr. Shepherd. An adjournment was next made to the Globe Hotel, where the party were received and entertained to lunch by Captain E. F. Morrison Bell, M.P. After the toast of "The King," Mr. D. Wrayford proposed "Success to the B.D.F.A." Mr. Jas. Sadler, in replying, said the Association stood first for quality and purity of British dairy products, and, secondly, for the protection in every possible way of those who were engaged in the production or distribution of British dairy produce against every form of adulteration whatsoever. The Association was a living permanent protest against the taking of agricultural produce. It was not merely a selfish protest. They were protecting in the very highest possible way the interests of the people of this land, who ought to consume a great deal more of British dairy produce than they were consuming to-day, and who were not consuming anything like as much dairy produce as they thought they were. He asked of Captain Morrison Bell and those associated with him in the House of Commons, that while they kept before themselves lofty ideals of what ought to be, they would not make it impossible for them to carry on business in a peaceful and legitimate manner.

Mr. S. R. Whitley, in proposing "Our Host," spoke of the low price of dairy produce in the market that day, and considered a great improvement might be made by co-operation.

Captain Morrison Bell having briefly replied, a move was again made for the motors, and proceeding *via* Kingskerswell and Torre we drove to Messrs. W. and H. Whitley's farms at Primley, Paignton. Seldom can we see such a magnificent collection of prize animals. First and foremost came the Shire Horses, and, despite the absence of several of them at Totnes Show, we saw the famous London champion mare Lorna Doone, now four years old, and looking in the best of condition, and others too numerous to mention. The number of excellent hunters and polo and Shetland ponies were too numerous to attempt a detailed description of them. Some very fine pedigree hunter mares and foals were running in a field near by, also a remarkably varied collection of Shetland ponies.

Passing from the horses to the cattle, we had the pleasure of seeing some of the best of South Devon cattle. They were large, long-sided, deep-ribbed, with backs and sides well covered with flesh, and with udders of a remarkably good shape, indicating plenty of milk, and, as Mr. Hannaford, the capable Bailiff, had told us in his paper earlier in the day, a remarkably grand "dual-purpose animal." Great admiration was expressed when we saw a magnificent three-year-old bull, Primley Excelsior, who has an unbeaten record, and it was generally agreed he would compare favourably with show representatives of other breeds. The sheep of the South Devon and Hampshire Down breeds were a good lot. Some very good large black pigs were to be seen. Many of us saw for the first time blue mice, blue rabbits, blue pointers, blue African owls, and some priceless homers one of which had won over £400 in prizes. The poultry which are kept for exhibition purposes alone were ranged in extensive orchards, and consist of a number of breeds; one thing in particular that took our fancy being the blue turkeys. The kennels were very extensive and contained some splendid lots of spaniels, great danes, smooth collies, setters, and greyhounds. After inspecting this wonderful collection under the rays of an almost tropical sun, it was with pleasure we seated ourselves under the beautiful trees on the lawn, where a very fine band added to the pleasure and enjoyment of a delicious afternoon tea with the best of Devonshire delicacies. After tea the best specimens of all the animals were paraded in the park for a closer inspection, the principal interest centering in a gigantic steer just over three years old. We all had to have a guess at the weight. When the judgments were read out they varied from  $19\frac{1}{2}$  cwt. to  $32\frac{1}{2}$  cwt. The correct weight was 24 cwt. 2 qrs. 7 lbs. A fact that caused considerable amusement to many of the party was that not a single Devonshire man guessed within  $1\frac{1}{2}$  cwt. of the correct figure. About 6.30 we started on our long drive to Plymouth—about 30 miles. Opportunities not mentioned in the official catalogue for viewing the country at various points during the first half of the journey were given through the motors appearing to require breathing time; but after we passed the very romantic and picturesque village of Ivybridge we had a very fine run without any delays to Plymouth. After a most enjoyable, but rather long day, all were glad to reach their hotels in time for dinner, about 10.15, an hour and a quarter behind scheduled time.

*Thursday, May 21st.*—Breakfast at 7.45 a.m. At nine o'clock the motors are again at the door, this time for a drive *via* The Hoe and Keyham Dockyard to visit Ernsettle Farm, St. Budeaux, at the invitation of Mr. R. E. Cocks, J.P., of the X.L. Dairy, Plymouth. Here we saw a herd of 102 cows in milk. We were conducted over the buildings by Mr. and Mrs. Cocks. Some of our party were inclined to think the airspace in the cowhouses rather small for such large animals; but as they seemed to thrive, and as the South Devon breed is practically free from tuberculosis, they agreed it was quite satisfactory. Everywhere throughout there was evidence of keen business management. The barn machinery was most economically and well disposed, so that labour was at a minimum. Next, our visit was to the spacious town stables and garage, and the thoroughly up-to-date offices and well-appointed dairy premises. At 12.30 we were entertained to lunch in the St. Andrew's Hall by Mr. Cocks, who had also invited a number of leading inhabitants of the "Three Towns" and farmers near to join us, a very large party being present.

The Mayor of Plymouth afterwards extended a warm welcome to the visitors, and asked them to drink to the health of Mr. and Mrs. Cocks.

On behalf of the Association Mr. E. W. Caddick proposed a vote of thanks to Mr. and Mrs. Cocks, who briefly replied, and another move was made, this time to inspect the stock on another farm of Mr. Cocks, at Ranleigh. Here we saw a herd of 106 cows in the stalls and a remarkably good bull. The members of our party were not slow in asking questions of Mr. Cocks, who very kindly imparted a great deal of useful information. The total herds on the farms numbered about 400, more than half being bred on the farms. Our visit here was short, as at three o'clock we were due to board a steamer for a trip up the Hamoaze as far as the famous Saltash Bridge, which connects Devon with Cornwall on the Great Western Railway. We had a magnificent view of the Dockyards and Plymouth, and landed at Mount Edgcumbe, where we were kindly entertained to tea at the invitation of the Right Hon. the Earl of Mount Edgcumbe in his famous orangery. We were then shown over the grounds by Mr. Sandercock, the agent. Seldom have we had the pleasure of seeing such tropical luxuriance as was everywhere demonstrated. A whole square was devoted to oranges in boxes, and we saw many oranges in an embryo stage. In the winter these are carried into a huge, lofty, well-lighted house to protect them from frosts. Some curious varieties of conifers, a row of cork trees, and the luxuriance of the vegetation, and the beautiful flowers made it difficult for some to get back to the boat in time. Before going on board Mr. Nisbet, on behalf of the members, thanked Mr. Sandercock for his kindness in piloting us over the grounds, and asked him to convey to the Earl our best thanks for his kind hospitality.

At 7 p.m. we met at the Royal Hotel, Plymouth, for dinner with guests, of whom several were present, including the Mayor and Town Clerk of Plymouth. The toast list was short, the only important one being given by Alderman Taylor, and this was "The Health of the Mayor," who briefly replied. An adjournment was then made to the Museum, where the last Paper of the Conference was read by Mr. R. E. Cocks, J.P., the subject being "The Preparation and Marketing of Devonshire Clotted Cream." The hour (9 p.m.) was certainly rather late for such a gathering, but those who attended were amply repaid for the energy necessary to draw them from the comfortable hotel lounge by hearing a most interesting and amusing discussion. Amongst those who took part in the discussion were Mr. Thornton, Miss Stubbs, Mr. E. G. F. Walker, Mr. S. R. Whitley, Mr. Ibbot, Mr. J. Sparrow Wroth, Mr. C. Smith, Mr. Norrish, and Mr. Tucker. But for the lateness of the hour it is probable this discussion would have been much longer, as it was becoming rather an argument between representatives of Devon and Cornwall as to which county produced the best, and much amusement was created when the Chairman (Mr. W. J. Grant), in proposing a vote of thanks to Mr. Cocks, observed that the clotted cream industry started in Cornwall in the time of King Solomon.

*Friday, May 22nd.*—Another early breakfast (7 a.m.). At 8.30 we again boarded the motors and drove along the banks of the Hamoaze, where we crossed on the ferry to Cornwall. A drive of about four or five miles brought us to Pentillie Castle, the beautiful residence of Mr. W. Coryton. Here we were most courteously received by Mr. and Mrs. Coryton and family. Our host is one of the true type of old English country gentlemen, so few of whom now remain. Personally he knew almost every cow and every tree on his beautiful estate of 11,000 acres. As an evidence of the life he leads it is interesting to know he has been Master of the Dartmoor Hounds for 35 years. He personally conducted us over the farms in hand, extending to 1,400 acres, being ably assisted by Miss Coryton and other members of the household. About 900 head of cattle are kept, and we saw about 600 cows in milk, all of

which were milked by hand, mostly of the South Devon breed, with some Guernseys and crosses. During the week before our visit 31,189 quarts of milk had been produced, of which 5,438 quarts were put through the separator, the remainder being sent to the Three Towns Dairy at Plymouth, of which Mr. Coryton is the proprietor. The number of bulls used is 15. There were 110 pigs on the farm and 36 working horses. The cows were of a true commercial type and were grazing on the soundest of pastures. The analysis of the milk produced by the Coryton herd is: Total solids, 13·63 per cent.; fat, 4·50 per cent.; casein, sugar, &c., 9·13 per cent.; and water, 86·37. This demonstrates the suitability of the milk of South Devon cows for making clotted cream. To many of us the most interesting feature on the estate was on Viverdon Downs, where Mr. Coryton has reclaimed 600 acres of poor land. In February, 1899, this was commenced, and what had been boggy and rocky land, growing nothing but furze and bracken, was dug by spade cultivation. Soon a huge plough was made on purpose for the work; this required six or eight horses to draw it. This is the only plough of the same pattern in existence, and one could not but be struck by the arrangements whereby such a heavy implement was capable of being used. The land was at first heavily limed (about 56 bushels per acre). The first two crops grown were oats, manured with 4 cwt. kainit and 4 cwt. basic slag and super. An annual top dressing is spread over the grass, consisting of basic slag and supers. On closely examining the pasture on land of seven or eight years' standing, we were impressed by the remarkable improvement shown. To effect this improvement has cost Mr. Coryton £1,000 per year since 1899; but when one saw the huge hayricks and well-tilled fields, many of us thought of the wasteful use of commons in many parishes, which might be used to a much better purpose.

A fine idea was employed in the water supply. This was done through the medium of two dams, one working at a lower level from the waste of the other. The fences cost £1 per perch, and good roads have been made. Such public spirit as is manifested by Mr. Coryton is indeed well worthy of emulation, and it does seem a pity that such a service rendered to the community should only be recompensed by heavier taxation. We then motored back to Pentillie Castle, where we were hospitably entertained to light refreshments; after which we wandered through the beautiful grounds containing many rare flowers and shrubs to our buses, and after a hearty vote of thanks to our host and family, we drove off to Plymouth, where we were entertained to luncheon by the Mayor at the Royal Hotel. After a short toast list, we again drove through the busy streets of Plymouth to His Majesty's Dockyard at Devonport, where we were met by members of the Metropolitan Police, who conducted us over the yards, explaining the various types of battleships. We saw submarines under repair, the *Warspite* receiving her armour plates, torpedoes, Dreadnoughts, and super-Dreadnoughts in course of construction. The whole Dockyard represented a construction devised for destruction. We proceeded by a tug round the Dockyard to the South Gate. The huge victualling sheds we passed gave us an idea of the immensity of the problem of feeding even our Plymouth fleet. Eventually we stepped ashore, and were conveyed to the Royal Hotel, Devonport, where we were entertained to tea by Mr. Thomas Cundy, of the Devonshire Dairy, Stoke, Devonport. The guests were received by Miss Edith Cundy on behalf of her grandfather. A number of friends had been invited to join the party, and after a delightful little repast, enlivened by cheery music and good singing, we proceeded to Mr. Thomas Cundy's Dairy, where the process of making Devonshire cream was again explained to us.

The same cleanliness and efficiency prevailed in Mr. Cundy's dairy as were evident in the others we had visited, and he may well be proud of the fact that he was the first to use steam as a means of heating the water for scalding the milk in the production of Devonshire cream. This was the last dairy to be visited on the tour, and, though not as extensive as some, the party were loud in their praise of the way in which the dairy and shop were laid out, and were pleased to see many records of prizes won by Mr. Cundy at the Dairy Shows.

Climbing up from the dairy we reached the famous Mount Pleasant Redoubt, where we had a magnificent view of the surrounding country—the Cornish hills and Dartmoor in the distance, and the Channel dotted with battleships, and busy small boats plying to and from the shore. We strolled down to the hotel for dinner. This being in reality a farewell dinner, a few guests were present, and after the meal was concluded a social evening was spent, a most enjoyable programme being carried out, the principal entertainers being Messrs. R. M. McGuire, John Brown, F. E. Hardcastle, F. J. Bull, and two very good local singers. At about 10.30 p.m. we returned to our hotels in Plymouth.

*Saturday, May 23rd.*—Another early breakfast (7 a.m.), as we have to start at 7.45 for a motor journey of about 20 miles to Endsleigh Palace, the beautiful seat of His Grace the Duke of Bedford. For the first time on our tour the rain greeted us as we left our hotels, but fortunately it was not heavy, and had the advantage of laying the dust. On arrival at Endsleigh we were welcomed by Mr. Rundle, the agent to His Grace, and conducted over the grounds. The beauties of this place can hardly be expressed. The first thing of note was the Swiss Cottage, an exceedingly pretty dwelling, built in the Swiss chalet fashion. Next we went to the Rock Garden, which contained many rare plants, the whole being picturesquely set out. We then came to the River Tamar, which is the boundary between Devon and Cornwall and divides the estate in half. The palace itself is beautifully situated, and is covered with creepers; it is both commodious and comfortable. We saw some banks of rhododendrons of all shades and colours, and the grotto; entirely built of shells, with a spring bubbling up in the centre. We then wended our way to a large marquee, where we were entertained to lunch by His Grace.

Mr. Sadler, in a very neat speech, conveyed our thanks to the Duke through Mr. Rundle, who briefly responded.

About 12.30 we again mounted our buses for a long drive over Dartmoor; for this we should have preferred one of the hot days we had earlier in the week. The drive of about 17 miles was very cold; the stops were rather frequent as the hills were so steep; the buses refused to go up without a lot of coaxing, and then at a very slow speed. It was evident early in the journey that it would be impossible to reach Moretonhampstead by the scheduled time, so when we reached Post Bridge the little post and telegraph office was besieged by such numbers of people sending telegrams to friends, informing them of delay, as quite upset the usually quiet little place. We reached the Manor House, North Bovey, about five o'clock, two hours behind time. Here we were received by Viscountess Hambleden and entertained to tea, and during the whole tour a cup of tea was never more appreciated by all the party than after that cold drive across Dartmoor. We were shown over the grounds and mansion. At 6 p.m. a start was made for Moretonhampstead Station, where the railway company had reserved carriages for London and Bristol and the North; but I think a fair number of members took the opportunity of spending the week-end in Torquay, Exeter, and Plymouth.



So ended the Devonshire Conference, and the desire of those who assisted in making the arrangements is that it may be the means of adding members to the Association, and of inducing the Devonshire breeders to send more of their excellent cattle to the dairy shows.



**South Devon Cow, "PRINCESS 3rd" (6752).**

The property of Messrs. W. & H. Whitley, Frimley Farm, Paignton. Winner of Silver Cup for the Best Pedigree South Devon Cow for Dairy purposes ; Silver Medal of the British Dairy Farmers' Association for the best Dairy Cow of any age or breed in the Show, and Gold Medal of the British Dairy Farmers' Association for the Best Dairy Cow of the North or South Devon breed or type at Devon County Show, Totnes, May, 1914.

## FARMING IN ENGLAND IN EARLY TIMES.

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By Professor WALTER J. HARTE, University College, Exeter.

THOSE engaged in trying to elucidate what is called History are sometimes expected to show an omniscience which is not demanded of other searchers after Truth ; for there is a history of

“shoes and ships and sealing-wax,  
of cabbages and kings,”

to mention only a few of the subjects of my all-embracing department. So, when your Committee honoured me with an invitation to read a paper to you, I at once had to disclose some of my limitations, and to confess that I had very little in my stock that was likely to be suitable for this meeting. When my offer of “Farming in England in Early Times” was accepted, I realised that my ideas about the words “farm” and “dairy” were very vague, and, of course, I went to consult Sir James Murray’s New English Dictionary. There I found that no satisfactory Teutonic etymology was known for the word “farm,” but that it was possibly a late form of the Latin word “firma,” which signified a fixed yearly payment, and then a lease, and then a tract of land held on lease for the purpose of cultivation, and from that the name was applied without respect to the nature of the tenure. As for “dairy” it is derived from “dey,” which is Middle English for a female servant, and dairy is a place where the function of the dey is performed. Then it means the room or building in which milk and cream are kept and made into butter and cheese, and, lastly, that department of farming concerned with the production of milk, butter, and cheese. This did not give me much assurance that the paper which your Committee had accepted from me would be to the point at a meeting of British Dairy Farmers, for there is not much in it about milk and butter and cheese. However, I was cheered by the thought that under modern conditions the production of one set of commodities involves the subsidiary production of a great many other by-products, and my optimism was strengthened when at the Eastgate I gazed into the windows of that distributing centre with the ecclesiastical name and saw displayed there an array of commodities which certainly did not come from milk ; and the sight caused me to hope that my contribution would not be too wide of the mark, unless, indeed, the Cathedral Dairy has a special dispensation or some benefit of clergy which is at present unknown to history.

The Norman conquerors found England divided up into self-supporting villages, which soon came to be known as manors. For the purposes of our story we need not go into the consideration of the legal and other differences between the Saxon village and the Norman manor, so let us at once try to picture to ourselves what this agricultural unit was like. The system seems to have been the outcome of a very

early method of annual re-allotment of arable, which expressed the old sense of kinship, linked with a determination to secure some kind of equality. With its concentration of huts and barns and the close proximity of its arable and pasture, it was a very suitable arrangement for a time when all able-bodied men were liable to be called off for purposes of fighting.

At the head of the village was the lord, with rights and duties pertaining to his holding. He would have his manor house of stone, containing at least a hall, a dormitory and a solar. The dairy would be attached to the manor house. There would also be a grange for storing corn, and probably a garden and an orchard. The ground would be cultivated right up to the doors of the house, for a park or pleasure-ground is a modern development. The church would probably be far larger than was needful for the religious services of the community; but it had many uses besides that of divine service, and in some cases we find it used for storing corn. The village mill would belong to the lord, who would rent it to a miller, and the villagers were compelled to have their corn ground at it. The mud or wooden cottages of the inhabitants would lie along the highway, each with its enclosed croft or close. The arable land lay in open fields, and was worked on what is called the "Two-", or else the "Three-Field" system. Under the latter system the whole of the arable land of the village would be divided into three great fields. On one of these was a crop of wheat, on the second a crop of barley or oats, while the third field lay fallow. Each field was divided into long narrow strips, separated from one another by balks of grass, and the tenants would occupy scattered strips in different parts of these open fields, some holding many separate strips and some only a few. The lord also would have his portion, which he farmed for himself through his bailiff. His was called the "demesne land," and it was sometimes held in strips and sometimes held in severalty. In addition to the three arable fields, there were the meadow for hay, the pasture ground and the waste, and in time an enclosed pasture which was very valuable; and every man who had strips in the arable had a proportionate share of the hay meadow, and certain rights of pasturage, and (unless they were definitely assigned to others) over the waste and over the fallow and gleaned land, for the oxen, horses, or sheep required on the arable for work or manure.

In Tudor times pasture in common was of three kinds: (1) common close, where each man was stinted; (2) tended common where cattle went before the herdsman, and where stints prevailed; (3) the lord's outwoods, where the lord was not stinted but the tenant was. This "shackage" as it was called, is considered by Professor Gonner to be a species of common custom, originating in mutual forbearance as to trespass.

But this is far in advance of the early village economy. However, as time went on enclosed pasturage increased, and we note such names as "Cow Down," "Sheep Down," "Pig Marsh." These divisions mark the growing importance attached to live-stock.

These rights over the land were supplemented by common of estover and common of turbary, the former being the right of taking wood for repairs and for fuel, and the latter the right of cutting peat for fuel.

Professor Gonner distinguishes common "appendant" from common "appurtenant." The former being the right to common on the part of the possessor of a freehold created before the Statute of *Quia Emptores*. It was limited to pasture for the animals necessary to plough and manure the soil, was proved by mere possession of such an estate, and would be proportioned to the holding. Common "appurtenant" consisted of rights attached by grant or prescription to a freehold or copyhold, including pasture for beasts other than those for ploughing and manure, also estover and turbary, and of this proof might be required. This latter shows that times were changing—new holdings had been erected and a variation of methods of cultivation had arisen, the proportion of arable to stock being no longer constant. Common was no longer regarded merely as a means of maintaining arable land in efficiency, but some part of it existed for immediate profit by pasturage.

At first common right was a necessary complement to the rural economy, then it became a source of special profit, then by some a system of common was valuable as a means of chance gains. In the nineteenth century the idea of a public interest or right appears.

To put it shortly, the holding of arable lands gave a right over some part of the yield of other lands, and generally, too, over the lord's waste. Later the poor came to enjoy minor rights of common, and turned out pigs and geese, gathered fuel, and even pastured a cow, but these privileges began on sufferance and were really a trespass.

On some manors the lord exercised the right of feeding sheep over the lands of the tenants during certain seasons of the year, and even of having the tenants' sheep folded on the demesne fields for the sake of the manure. Then in time we find the granting of rights over land attached to a house or cottage without arable land; and the next step will be a grant to men who hold no land on the manor, though these might be restricted during hay-time.

In copyholds we find the right of pasturing beasts other than those used for agriculture, namely, sheep, swine, goats, and geese, in proportion to the holding and the capacity of the area, unless a definite number is mentioned in the document.

This open-field system was usual all over the greater part of England a hundred and fifty years ago, and there are still a few survivals at the present time. Sir J. B. Phear, in the "*Transactions of the Devonshire Association*" for the year 1889, describes such a field at Braunton. There is found what is called "*The Great Field*," consisting of about three hundred and fifty acres of level ground made up of small unenclosed plots. There are some sixteen parcels, each divided into strips separated by a balk. Each parcel is marked off by a stone sunk in the ground at the corners. Most of the holdings are small, there being four hundred and ninety-one strips to about fifty-six owners. Apparently

here all the villeins had freed themselves, for their successors are emancipated from all the original "servitudes" and are freeholders.

Walter of Henley, a farmer and perhaps a bailiff on an estate belonging to Canterbury Cathedral, who wrote in the thirteenth century, shows clearly that the farming at this time was "subsistence" farming, and only the surplus crops were sold at the local markets or at the annual fairs, after the wants of the village, including part payment of labour, had been satisfied.

Besides the demesne land, there were sometimes estates of freeholders who paid quit-rents to the lord. But most of the land would be held by villeins, bordars, and cottiers, who held by fixed and commutable services. The normal holding of a villein was a virgate, or yardland, of thirty acres, whilst the cottier would have only a cottage and a garden and at the most five acres.

The following extract, which is a translation from the "Exeter Domesday," gives one an idea of the village of Branton to which I have already referred: "The King has a manor called Branton which King Edward himself held and it was answerable for one hide. This can be ploughed by forty ploughs. Of it the King has one carucate of land and one plough, and the villeins have thirty ploughs. There the King has forty villeins and thirty bordars and four serfs and one hundred sheep and forty acres of coppice and two acres of meadow and forty acres of pasture, and it returns yearly sixteen pounds by weight.

"Algar the priest has one hide of land in Branton which he holds in alms of the King. This can be ploughed by eight ploughs. Of it the priest has one virgate and three ploughs in demesne and the villeins have three virgates and five ploughs. There the priest has three villeins and twenty-three bordars and five head of cattle and twelve swine and one hundred sheep and ten goats and twenty acres of pasture, and it is worth fifty shillings."

The work of the village was done by the co-operation of all the inhabitants, and we must remember that practically all men were landholders. There was community in cultivation but not in ownership.

The demesne was cultivated by dependents wholly maintained by the lord and by the part-time services of the villeins, each of which would have work somewhat as follows: He would have to plough in the spring four acres, and to supply two oxen for the plough-team three days in winter, and three in spring, and one in summer. Each would work for his lord three days a week, and perhaps pay a yearly toll of money, say two shillings, a hen and a score of eggs. Each cottier would work one day a week. The following quotation gives us the duties of one Hugh, son of Chrispian, at Haghe, who held a messuage and a quarterium of land. He was to pay one shilling a year in rent, to carry dung at a halfpenny a day, or to give three-halfpence instead. He was to plough and to be fed, or to pay sixpence for the year's work. He was to gather nuts for three days or to forfeit three-halfpence. He was to supply one man in harvest or pay two shillings, to plough half

an acre for winter and another half for Lent corn or pay sevenpence. He was to shear sheep and lambs or pay a halfpenny a day, to hoe and be fed or forfeit three-farthings a day. To collect stubble for three days before dinner and receive a halfpenny or forfeit three-halfpence. To give a hen of the value of twopence and a cock worth three-halfpence, and find a help for the thatcher or forfeit three-farthings. These services would in process of time be commuted for a money payment. The terms would be written down and a copy kept by the tenant, who would then become a copyholder.

The cattle, sheep and swine would be looked after by village officials, the herdsman receiving about twopence a quarter for each beast, and the swineherd one penny.

A writer in the sixteenth century called Fitzherbert gives what he considers to be the duties of a wife in the life of the manor—"It is a wyves occupation to wynowe all maner of cornes, to make malte, to washe and wrynge, to make hey, shere corne and in tyme of nede to helpe her husbunde to fyll the mucke wayne or dounge cart, dryve the plough, to loode hey, corne, and such other, and to go or ride to the market to sell butter, chese, mylke, egges, chekyns, capons, hennes, pygges, gese and all maner of cornes."

For hay-making additional labour was often obtained from a distance if possible. The means of supporting winter stock depended upon the supply of hay, so the bailiff, after calculating his resources, killed down for salting, about St. Martin's Day (11th November) as many sheep, oxen and calves as exceeded his means of sustenance.

It is obvious that this system of farming involved an intricate mesh of mutual privileges and obligations, and it must have required a very tactful bailiff to get anything like a moderate amount of work out of the parties concerned, because we must remember that tenants could not be dismissed as can the modern labourer, and besides it would have been impossible to find others to fill up the vacant places even if it were desirable to do so.

The small freeholder on a manor, where such existed, was really better off than the lord, as the former was liable to no wardship and could dispose of his property as he desired, whereas the lord was responsible to his overlord for all feudal dues. The wealth of the lord was derived less from the profit of the demesne land than from the fines, quit rents, compositions, tolls on fairs, markets and ferries, profits from manor courts, and similar incomings, which though trivial individually amounted in the aggregate to a considerable sum.

One naturally asks how it was that a system which from our point of view was so very inconvenient prevailed for such a lengthy period. The answer seems to be that when once in working order the method formed a complex system hard to alter, especially as the art of land-surveying was unknown; that custom, which is difficult to break even at the present time, was in olden times an impassable barrier to experiment and progress; that it ensured an equitable distribution as far as the quality of the land was concerned; that it showed up any very

bad husbandry or extreme negligence, and, if it did not facilitate the improvement of the land, it at any rate kept it from becoming worse.

Before proceeding I must draw your attention to the two-field system at work on some estates. In one of these fields there would be a crop growing, and in the other there would be three ploughings in the course of the year. We find an interesting modification of this method when each field was divided into half fields and then each was "cropped" every alternate year, but the half which bore wheat one year would be sown with barley next time it was "cropped." Thus a four-field system was introduced and this was very easily changed into a four-course husbandry in the eighteenth century with the introduction of turnips, making a rotation of wheat, turnips, barley and clover, and thus avoiding the necessity of keeping one field fallow, as in the old system.

And now before we go on to describe the changes brought about by the Black Death in the reign of Edward III., let me give you a few details about what was produced on the manor, and the expenses entailed in cultivating it.

In 1340 beef or mutton cost about a farthing a pound.\* In London in 1533 beef cost a halfpenny and mutton three-farthings a pound.† But the meat must have been stringy and tough, and diseased meat was cooked and eaten. Walter of Henley writes (about 1270): "If one of your sheep dies, put the flesh at once into water and "keep it there from daybreak till nones (3 p.m.), then hang it up to "drain thoroughly, salt it and dry it; it will do for your labourers." And Tusser in the sixteenth century recommends that diseased pigs should be slain, salted, packed, and the pork sold to the Flemings.

Even as late as 1547, the average weight of oxen purchased for the Navy was less than 400 lbs. English sheep suffered from scab before the end of the thirteenth century, and the affected parts were treated with tar mixed with butter or lard.

The most important animal in mediæval economy was the pig. These animals fed in fields after harvest and in woods. We read of them also in the towns. Thus Stow in his "Survey of London," says that they fed on the dung hills, and in the Act Books of the Exeter City Chamber I have found frequent notices of men who were brought before the Justices for keeping pigs in the City contrary to regulation.

The returns to agriculture were very low in these days of subsistence farming, and it is very difficult to form any sure estimate as to comparative values, for the prices quoted only represent the surplus on the estate sold after the requirements of the inhabitants had been satisfied, the first care being to make the manor as self-supporting as possible. Besides, the imperfect means of communication caused great variations in price, the cost of carrying corn by cart with two horses and a man about 1340 being estimated at one penny a ton per mile. But this would vary very much according to the time of the year, and the demand for horse work on the farm.

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\* Multiply by twelve to get the approximate value now.

† Multiply by four to get the approximate value now.

Wheat was the customary food of the people, though barley was sometimes mixed with wheat in allowances to farm servants. Wheat was sometimes malted, but barley was chiefly used for beer, and oat malt common. However, the chief use of oats was for horse food, although oatmeal was used for the broth or porridge.

Walter of Henley advises that two bushels of wheat should be sown to every acre. This seems to have been done by the bailiff himself. A return of between six to eight bushels was considered satisfactory, after the land had received three ploughings, at the cost of sixpence an acre, and harrowing at the cost of one penny. Ploughing was done by oxen yoked in a team of eight, although we find horses used in some places. But oxen were more satisfactory, because after they were past work they could be used for food. It is estimated that each person would require one quarter of wheat for his sustenance during the year, which would mean that there must have been as many acres under cultivation as there were inhabitants. Professor Thorold Rogers estimates that the population in 1340 was between one and a half and two and a half millions. This would mean that between four and a half and seven and a half million acres were under cultivation. We must remember that a great majority of the inhabitants, even of the towns, were engaged in agriculture, and the long vacation still enjoyed by the Law Courts and the Universities is said to have been due to the fact that all were required in the harvest fields between the months of June and October.

The corn appears to have been cut high on the stalk, and the stubble was mown after the crop was gathered. A method of threshing corn is mentioned in Marshall as peculiar to the West of England, the ears being beaten on a cask, so that the straw which was required for thatching should not get bruised. Fitzherbert, in 1523, says: "In Somerset they do shere theyr wheat very lowe; and the wheate strawe that they purpose to make thacke of they do not threshe it but cut off the ears and bynd it in sheves and call it rede." Matthew Paris gives the price of wheat in 1244 as being two shillings a quarter.

Iron was a most serious item among the commodities which the bailiff had to buy. Some came from Sussex, the most important iron district in England until the "Industrial Revolution" of the eighteenth century, and some came from Spain. The practice at first was for the bailiff to buy the raw material in bars at one of the great fairs and employ the village smith to make it up. But this plan was abandoned after the Black Death, and the bailiff bought the article itself from the smith, a procedure which points to the fact that the economic position of the latter must have been much advanced. The price of iron before the Plague was about four shillings a "hundred," and after that calamity it reached an average of nine shillings and sixpence. In 1500 the price of wrought iron averaged between £5 and £8 a ton, but by 1570 it was about double that amount.

Horseshoes for riding horses must have been very thin and poor. In the fifteenth century they were about two shillings a dozen for fore shoes and one and sixpence for hind, but by the end of the sixteenth



century they had risen to between three and four shillings a dozen for each kind. Those used in husbandry were far cheaper, being about eightpence a dozen.

The great expense of iron explains the fact that cart wheels were frequently made solid, cut from the section of a full-grown tree. Wooden ploughs and harrows with wooden pegs were used, and so the land was scratched rather than ploughed. The share of the plough must have been a very slight affair, having a wooden frame with an iron point to it. Steel was employed for the tips of the cutting edges of iron tools and was four times as dear as iron. Canvas had to be bought for mill sails and bags, and millstones were a heavy item in a bailiff's accounts. In 1331 the bailiff of Cuxham purchased five in London at the cost of £15 16s. 8d., and there were further expenses incurred in getting them carried to Henley by water, and thence on carts to Cuxham. The best stones came from the neighbourhood of Paris and from Andernach on the Rhine.

Candles and suet were sometimes dearer than butter, and all fats were dearer than meat, for a cow might be made to yield milk and so provide butter in winter, but the farmer could not give animals the means of putting on flesh—still less fat! So while meat was about a farthing a pound fat cost about three-halfpence or twopence. Candles averaged twopence a pound. They were therefore a rare luxury, and used on the farm only at lambing time. Rushes soaked in grease were the ordinary substitute for lighting purposes. The wick of the best candles was made of cotton which came from Sicily and Italy. Suet was used for candles and also for lubricating cart wheels and mill machinery, and for dubbing leather.

Cows were, of course, kept for butter, cheese and milk, but the milking of ewes was also a common practice in mediæval times, and Walter of Henley estimated that ten ewes were as productive in milk as one cow. Fitzherbert says: "In the poore of the peeke (high) countreye and such other places where as they use to mylke theyr ewes they used to wayne theyr lambes at twelve weekes old and to mylke theyr ewes five or syxe weekes." Milk was sold almost always at a penny a gallon.

Cheese and butter were produced on almost all estates, the latter being made all through the year, and it was often melted. It was used for sheep-dressing and cart grease as well as for food.

The manufacture of cheese commenced at Christmas and continued till Michaelmas. The price probably averaged about three-halfpence a pound. Two cows would produce a wey\* of cheese during the season, besides half a gallon of butter each week if the pasture was good†. From this it appears that some of the cheese was made of skimmed milk. Rennet was used, and the curd was put into a vat and pressed through cloths.

The custom grew up of letting out the produce of the cows and ewes at annual rents, the cows at about six shillings a year and the ewes at one shilling, the "deye" taking the risk and the owner

\* 196 lbs.

† Walter de Henley.

supplying the food. The reason suggested for this plan is that it was almost impossible for the bailiff to check the management of dairy.

It is surprising to learn how very small was the amount of wool which the mediæval sheep provided. The average weight of a fleece at Stockton in Sussex in 1267 was one pound one ounce, and the weight was seldom more than two pounds. The quality also was coarse and the fibre full of hairs. As to the price, Professor Rogers estimates that the average between the years 1260 and 1400 was just over two shillings the clove of seven pounds. The same authority notes a great variation in the prices of different districts in 1454, for at Leominster a stack of three hundred and sixty-four pounds fetched £13, and in Sussex only £2 10s. But wool does not as a rule appear in the bailiff's accounts, as its sale was effected by a special officer. After the shearing it was put up in canvas packs and sometimes stored in the church.

Eggs, poultry and also pigeons were exceedingly abundant. Honey did not fetch a high price. Professor Rogers thinks that bees were not commonly kept, but it looks rather as if bee-keeping was universal, and that there was, therefore, no market for honey. It was certainly much used instead of sugar and also in the manufacture of mead. The same authority thinks that rabbits were introduced into England about the year 1200. As they seldom wander more than a hundred yards from their homes they would spread very slowly. They were quite dear in 1270, the price being fivepence each.

There were very few vegetables; onions, leeks, mustard, peas, and possibly cabbages and nettles were grown in the gardens; apples and sometimes pears, in the orchards. Ale, made without hops, and cider were drunk in great quantities. Wine also was made in England, but not as generally as some suppose, the word *vicarium*\* being mistaken in manuscripts for *vinarium*.†

The constant recurrence of the name "Fish-ponds" throughout the country reminds us that whenever it was possible our forefathers ensured a constant supply of fish in their immediate neighbourhood. It was a dear commodity, but a very important article of diet, as it was the only animal food that the Church permitted during its fasts. It was also in great demand during the winter, to relieve the monotonous round of salt meats which our ancestors had to endure; but they did not restrict themselves in their choice as much as we do, for we find whale and porpoise, conger and eel all considered choice dishes.

The Black Death was certainly the most terrible epidemic in mediæval times. It reached the coast of Dorset in August, 1348, and rapidly spread over England. It was a time when the science of statistics was unknown and consequently we get the most exaggerated reports as to the mortality of the time, but it seems reasonable to conclude that nearly one-half of the labourers in England perished. This disaster jerked men out of the old ruts and necessitated changes in the conditions of tenure and occupation, whilst it finally resulted in the completion of the commutation of services into money rents which had been going on slowly for some time. In many places the calamity was so terrible that there were none left to till the land

\* Fishpond or warren.

† Vineyard.

or tend the flocks. Tenants died off and land went "a-begging." This was a serious state of affairs for the lord and threatened him with ruin. For the only time in English history the landlords competed for the services of labour, and wages rose enormously in spite of the attempts made by Parliament to keep them down, and the price of all commodities to which labour added the chief value, was often more than doubled. The attempts of the lords to compel men to go back to weekly labour failed, and it was necessary to plan a new system, or rather make use generally of a system which had been already evolved in some districts. This was what is called the "stock and land lease," in which the lord leased the land and provided the stock upon it. It did not, however, continue for more than fifty years, presumably because tenant farmers became opulent and were able to purchase their holdings. Then there was the ordinary lease which became the usual method, although before the Black Death it was most uncommon, except on some estates owned by the Church or by other corporations. In many other cases after 1348 the lords were only too willing to alienate small parcels of their land. Grants of demesne were made at new quit rents, and free-farm rents became general. These fixed rents at first seemed high, but agriculture improved, and they were easily borne.

Professor Rogers illustrates the state of affairs from extracts taken from the accounts of Merton College, Oxford. This corporation held lands situated in a great many counties, north, south, east and west, and even before the plague some of its lands were held on lease. After the plague all its lands, except those near Oxford, were let\* with the stock, and the rents were payable in money and corn.

Only in the Eastern Counties did the great landowners continue to practise agriculture on their own account.

But the most noticeable policy pursued at this time was the conversion of arable land into enclosed sheep walks. It was impossible to obtain labour to continue the old routine, and there was a great demand on the Continent for English wool. The enclosures then of the fourteenth century did not displace labour, but were necessitated by a dearth of that commodity, and with them capitalist farming may be said to begin. There was wool for sale instead of merely subsistence farming, and farming became a business which was expected to yield a return from the prices fetched in the market.

Moreover, by the end of the fifteenth century convertible husbandry had been introduced in some districts. This involved the breaking up of the permanent fields and the formation of six separate closes. Three were set aside for corn, with the rotation of wheat, barley and fallow, a fourth was for the pasturage of cows, a fifth for sheep, and the last was retained for meadow. This enclosure for tillage and grazing combined was a benefit to the community; more corn and food were produced, and the demand for labour in hedging and ditching increased.

It was not until Tudor times that we heard general complaints that

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\* Basingstoke for twenty-one years.

enclosure involved depopulation. The dissolution of the monasteries threw almost one-third of the land of this country into the hands of "new" men, and they were determined to work their new estates for a profit. The most lucrative kind of farming at the time was sheep-breeding. The result was a cry through the land that "sheep were the devourers of men." The distress caused by the conversions of arable to pasture reached its height in the reign of Edward VI, but the trouble did not end until, with the growing prosperity enjoyed during the reign of his sister Elizabeth, the population increased, and it paid to grow corn, and was no longer good management to graze only and not to till.

Capitalist sheep-farming led to the rise of a new phenomenon, namely, competitive rents. Mediæval rents were, as we see, practically fixed; they were quit rents and corresponded to the value of the labour services of which the lord was deprived by commutation. But rent under the new conditions became a payment for the use of the soil and the landlord came to expect a sum that represented the value of the land when used in the most remunerative way.

Although the greater part of English arable land was worked on the open field system until the middle of the eighteenth century, there were districts where the method had been abandoned long before, and some which were probably taken into enclosed cultivation from the start. Salop, Herefordshire, Worcestershire, Somerset, Devon, Wiltshire, Berkshire, Hertfordshire, Essex, Kent, Surrey, and Sussex had all been enclosed before the seventeenth century, and the same is probably true of Cornwall. Indications of very early enclosure are to be found in the very irregular form of fields, also in the smallness of their area, and in the thickness of the hedges and the high banks which surround them. Enclosed fields are to be expected in the districts which were occupied by the Saxon invaders in the later periods of their conquest; where the area was enlarged and cleared of forest, or drained after the original settlement had taken place; and also where new demands arose from the industrial development of the neighbourhood. This would result in arrangements for providing for the wants of the adjacent town, and the town, moreover, would tend to draw off people from the country-side, and those left would be driven to pasturage, because that made the least call on their reduced numbers. Nor must we forget that the proximity of a flourishing town was subversive to custom and encouraged men to farm for profit instead of for mere subsistence. We hear that Devonshire was so full of cloth-making by the middle of the seventeenth century that food and wool had to be imported to supply the needs of the inhabitants. Next we must notice that hilly, forest or moorland would soon prove unsuitable for an arable system. Further the demand for wool would encourage the formation of enclosures, the advantages of which were obvious as far as pasturage was concerned. Then new land turned out of the wild and held in severalty would show up all the disadvantages of the open field system and cry out for a change.

There is no documentary evidence of these early enclosures, for where tenants had no rights, or had ceased to have rights, the process would go on without leaving any evidence as to date. for there would be no protests, and no legal transactions. However, there is the Statute of Merton of 1236 to show that enclosure was proceeding even at that early time, for it grants to the lord the right of "approval" \* of as much land as he liked, provided that his action did not interfere with the legitimate claims of the tenants.

The counties bordering on Wales are said to have been affected by the condition of agriculture in that Principality where coaration did not exist. Professor Gonner, whose book on "Common Fields and Enclosure" is indispensable for the student of this subject, observes that where this was absent common right over arable after harvest would also vanish, and one of the difficulties of enclosing would be removed.

Marshall, writing in 1805, found that there were no common fields in West Devonshire. He saw that there the cultivated lands were all enclosed, having the appearance of having been formed from a state of common pasture, in which state some considerable part of the district remains. The better parts of these open commons evidently had formerly been in a state of aration, lying in obvious ridges and furrows and generally with the remains of hedgerows.—He suggests that this condition had arisen from the custom of the lord of the manor having the privilege of letting portions of common land to tenants for them to take one or more crops of corn, and after that it was allowed to revert to grass. Thus the lord would get the wild land tamed and would keep it in grass.

Enclosure of land for sheep-farming certainly took place in the fifteenth century, but probably it was rather the enclosure of common and waste than of arable. Also frequently demesne land was converted into pasturage. Enclosure for pasture was not always for wool, but for food when the district was near a growing town population.

Between 1550 and 1700 we get the enclosure of a great quantity of land hitherto wholly wild or in scant use in Cornwall.

The enclosures of this period are connected with the growth of farming, the new land brought into cultivation being largely arable; and this is especially true of the newly-drained areas. It is at this time also we notice the growing importance of the dairy, and the Gloucestershire Vales, West and North-East Wiltshire, with the Cricklade and Aylesbury districts, are all given by Professor Gonner as being enclosed by the end of this period. In Surrey, Sussex, and Kent the enclosures were probably made from the wild at an early date, but not for arable purposes. Much of the arable, though remaining "open" was held in severalty, and was not subject to common rights of pasture. The "enclosed" condition of Kent was fully recognised in Burton's Anatomy (1621). Norfolk, Suffolk, and Essex also appear to have passed through their stages of enclosure at a very early date. In Somerset there were very large enclosures from the

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\* Enclosure.

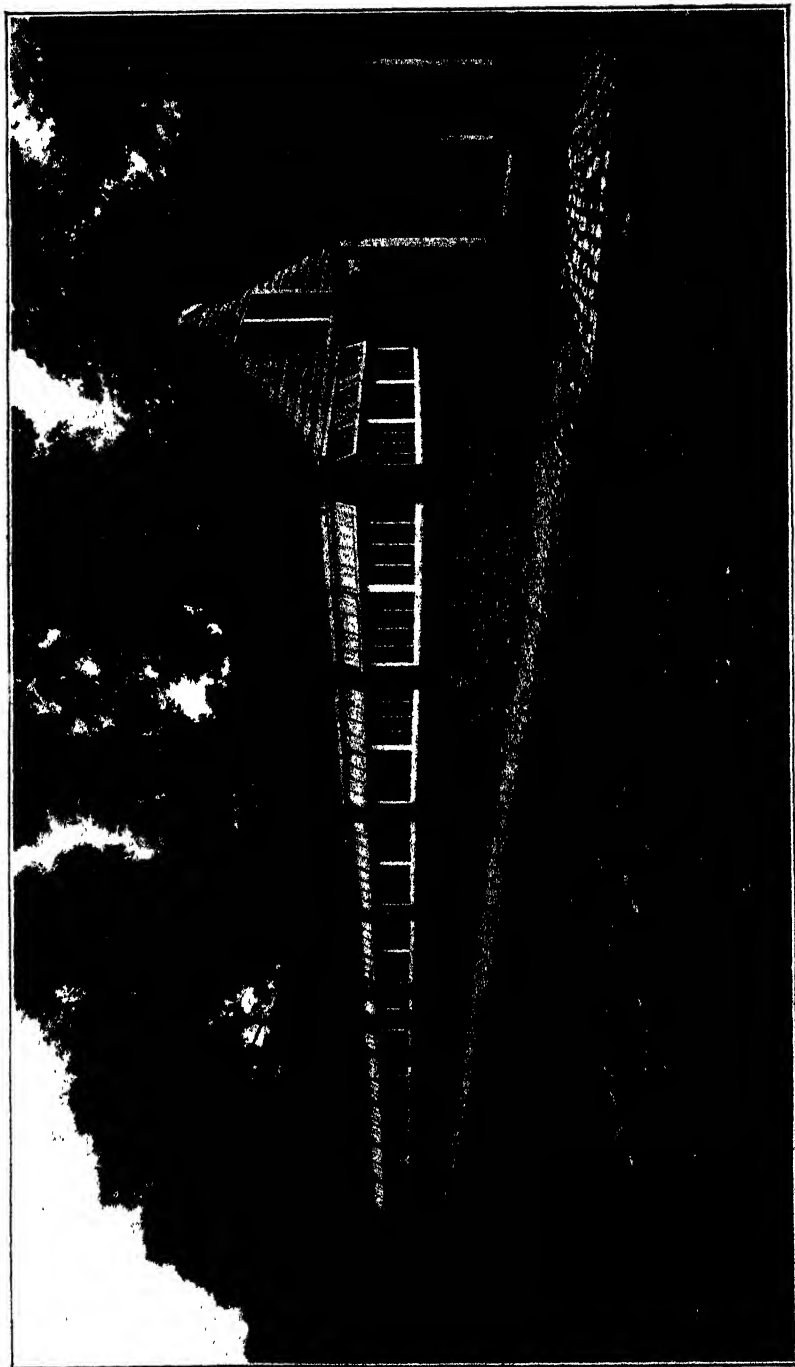
wild in early times, and also enclosures of open fields, especially around Taunton, and in the north-east. There was enclosure of demesne and possibly of common fields in the sixteenth century, and also probably of land from wild, and we may say that practically the bulk of this county was enclosed by 1700.

Great interest was shown in farming in the seventeenth century. Whilst in the sixteenth we have only two writers of any importance, Fitzherbert and Tusser, in the next century there were many more, including Markham, Weston, Platts and Taylor. Englishmen were interested in Flemish and Brabant methods of cultivation. It was at this time that the Cambridgeshire fens were drained, and also Hatfield Chase, near Doncaster, whilst the salt marshes of Essex and the low lands of Norfolk were banked against the sea, thus providing a largely extended area of good pasturage.

On the whole it would seem that in spite of the Civil Wars English farming industry thrived in the seventeenth century, and we find that the rents of both arable and pasture rose decidedly, though Professor Rogers attributes the rise to the demand made for land by those who had prospered by the growth of trade.

There is only one more development to be mentioned, and that is the introduction of turnips into the regular rotation of crops by Lord Townshend about the year 1730.

And now I must bring my remarks to a close, with the hope that I have not taken you with me so far into the past that you will be unable to return to the consideration of those modern conditions which are so essential to the successful prosecution of the art of dairy farming in modern times.



EXTERIOR OF COW-HOUSE.

## THE MODERN COW-HOUSE.

By G. TITUS BARRHAM, Sudbury Park, Middlesex.

It will be generally admitted that there is no more important question for the dairy farmer than that which relates to the building in which the cows are stalled, for upon the arrangement of this depends the comfort and health of the animals, the economy of labour and facility with which the work is conducted, and the cleanliness and wholesomeness of the milk produced.

I fully realise that in bringing this subject to the attention of the present audience anything of a fancy, or perhaps what is called a "model," character would be out of place, and I must therefore confine my remarks strictly to the practical side of the subject, and to what is desirable from the point of view of the dairy farmer who produces milk on a business basis.

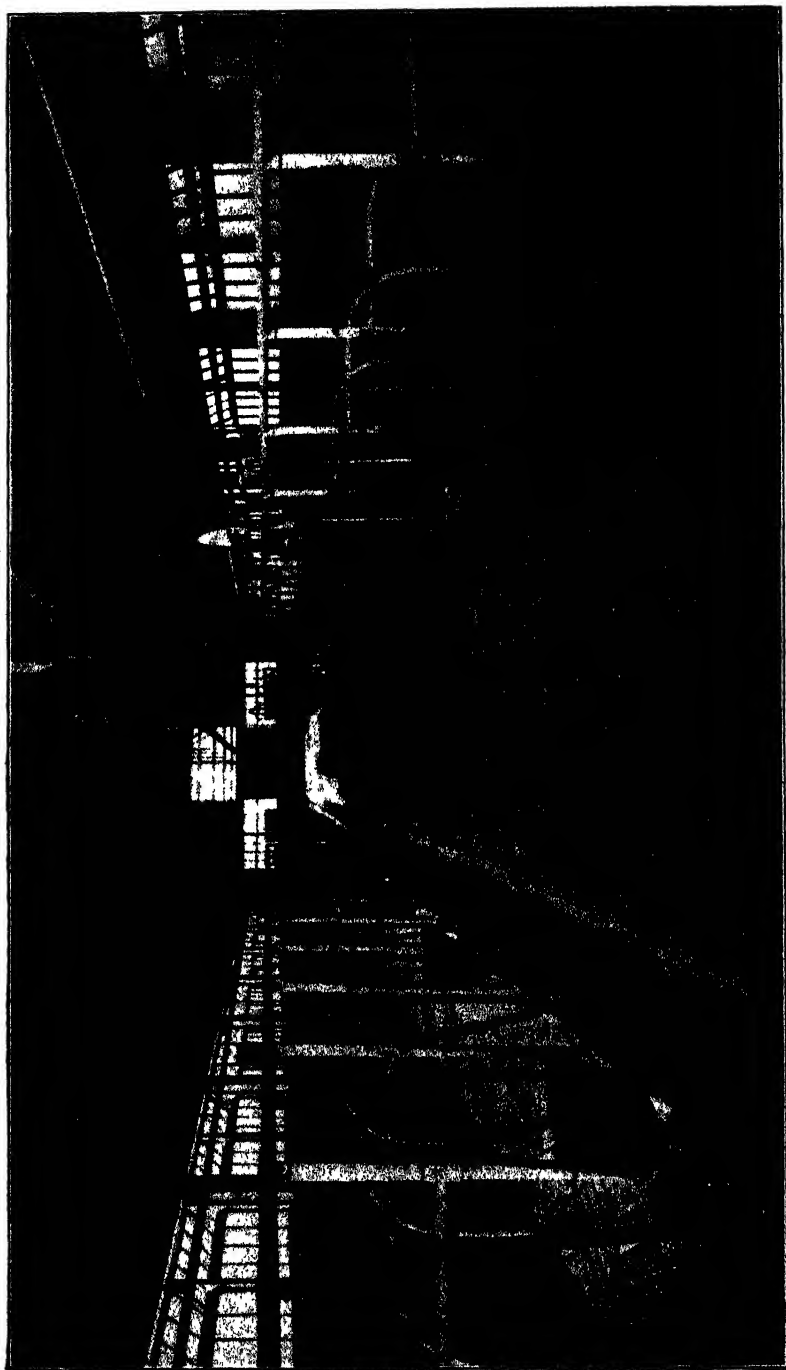
I do not remember that this question has ever been discussed at any of the previous dairy conferences; at all events, not for some years past. The only reference I have been able to find is a paper by our friend Mr. Primrose McConnell on "The Best Form of Cow-stall," which appeared in the *Journal of Association* published in 1899.

Whilst we cannot claim to have reached perfection in the construction of the cow-house, there can be no question that in the last two or three years great steps towards that desirable end have been made.

We must all recognise the fact that changes are going on all around us in every form of building and description of machinery, and it is no uncommon experience for manufacturers to what is called "scrap" their machinery, in some cases within a very few years, so as to take advantage of new inventions and further improvements. This remark applies in a minor degree to dairy farm buildings, and however reluctant we may be to make changes in those conditions to which our forefathers and we ourselves have been accustomed, we are bound to recognise that such changes are not only desirable, but are inevitable by reason of the more exacting requirements of the health authorities and the greater attention which is being given by the legislature to these matters.

In approaching the question of the modern cow-house I would direct your attention to the following fundamental principles upon which the conclusions in this paper are based:—(1) The prominence to be given to the use of granolithic Portland cement; (2) the adoption of galvanized steel barrel and the elimination of solid divisions; (3) abundance of light; (4) the use of overhead trolleys for feeding and for taking away the manure; and (5) the securing of the cows by means of iron stanchions instead of chains.





NEW COW-HOUSE—FEEDING GANGWAY.

Some twelve years ago I had occasion to remodel an old cow-house, and in doing so removed the wooden partitions which are generally used to divide each pair of cows. In place of these, two uprights of 2½-in. steel barrel were fixed, one where the head posts of the divisions formerly stood, and the other against the manger, so that the standings were open or continuous, the bars merely keeping the cows in position. These have been in use ever since and have been found quite successful. Eight years ago I built a new cow-house to hold 52 cows, and in that adopted 2-in. gas barrel for all the fittings, including a division between every cow and for the head rails.

Not long since I found that the use of galvanized barrel was becoming general in the United States. With the inventive genius which distinguishes our American cousins, they have made some advancement on what I had myself adopted, and in placing these particulars before you I have been able to review my own experiences in the light of American practice.

## A NEW COW-HOUSE.

### DIMENSIONS.

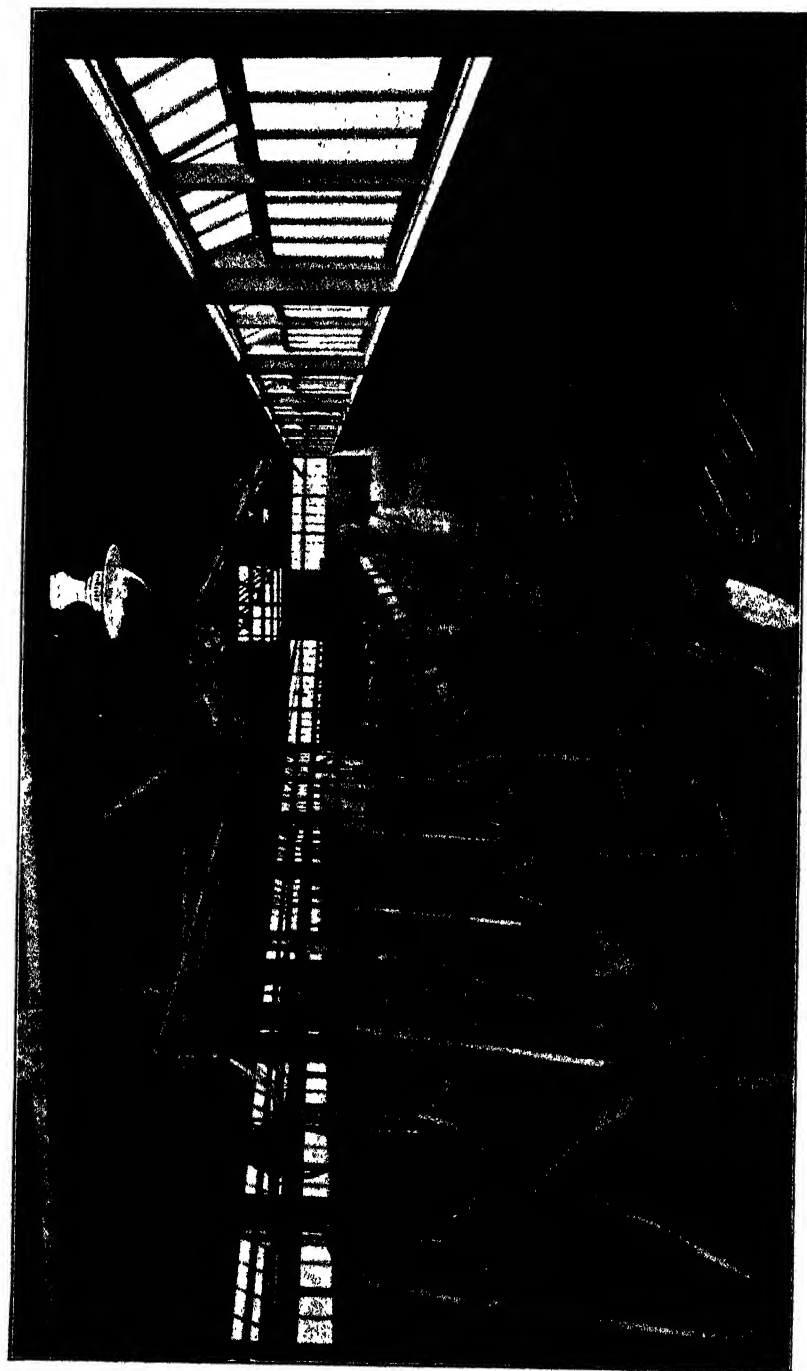
The dimensions of this will, of course, depend upon the number of cows kept, and as to whether a single or double row of standings are required, and in the latter case again, whether the cows' heads are to be against the wall or head to head.

For an example, I may mention that a shed for 52 cows in two rows, head to head, would be 100 ft. long and 33 ft. 6 in. wide. The latter is divided up as follows:—4 ft. 9 in. for each of the standings behind the cows, 1 ft. 9 in. for the gutters, 5 ft. 3 in. for the standings, 1 ft. 8 in. for the manger, and 6 ft. 8 in. for the centre gangway. The height to the eaves would be 8 ft. 6 in. and to the ridge 16 ft.

It will be seen from the section that the centre gangway is raised 8 or 9 inches, and along either side of this are the mangers. Next comes the kerb, which prevents the food from falling on to the standing and holds the iron bars which carry the stanchions and the division bars. This kerb should be 11 inches above the standing and 5 inches wide. Where the stanchion comes it should be cut out in a curve, so as to be at the lowest part 7 in. above the floor.

I do not myself attach great importance to the air space, but the dimensions I have quoted work out to about 800 cubic feet per cow. I would rely far more upon efficient ventilation, and should say that for all practical purposes an air space of 600 cubic feet per cow would fulfil all reasonable requirements.

Some dairy farmers prefer the heads of the cows to be against the walls, and where space is limited this is necessary, because the width in that case can be made 25 ft. for a double row of cows, while in the other case the space required would be 33 ft. 6 in. The initial cost of the building is also affected. It seems to me, however, rather an



NEW COW-HOUSE—REAR GANGWAY

advantage to have the cows with head to head so that the feeding takes place from the middle whilst all the manure is withdrawn from the two sides. If a large number of cows are kept, then the middle gangway might be left wide enough to permit of a horse and cart being drawn in with the fodder.

#### WALLS.

These should be built in either 9-in. brick or reinforced concrete, and should be covered on the inside with Portland cement trowelled to as fine a surface as possible. I would recommend that this should be carried to the eaves, because, if only taken 4 or 5 ft. high, there would remain the brickwork, which would have to be lime-whited once or twice a year. If the walls are rendered to the eaves no lime-whiting is required, and being of a smooth surface are easily washed down and kept clean.

It is an advantage where the walls join the floor to put all joints on the curve so as to be the more readily cleansed.

#### FLOORING.

For flooring nothing can be better than bricks broken to a small size, laid dry 6 in. thick and well rammed, and then covered with 2 or 2½ in. of granolithic cement brought up to an even surface.

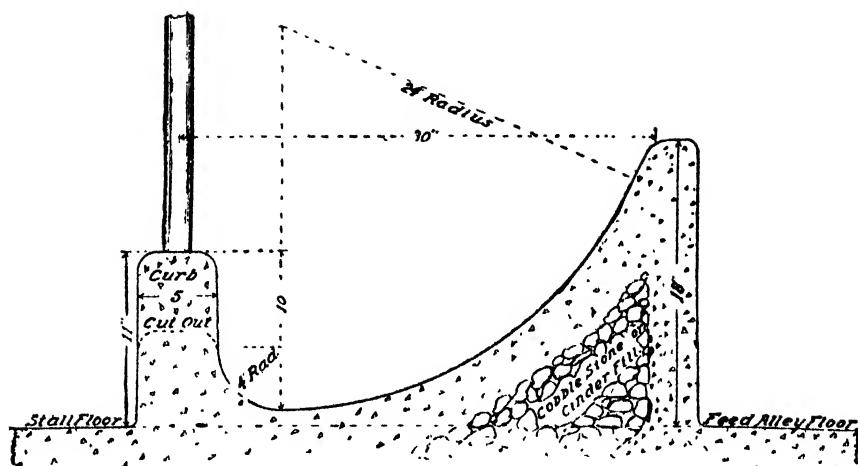
To provide a foothold for the cows it should be grooved in herring-bone fashion with the spaces about 5 in. apart, both on the standing and in the gangway behind the cows. The centre gangway would not require to be grooved. The cost of the flooring is from 5s. to 6s. per yard.

Many cow-houses have brick floors. If ordinary stocks are used these are very porous, and the joints soon become defective, while if the blue Staffordshire bricks are adopted, with cement joints, it has been found, in my experience, that these are more slippery than granolithic cement with grooves.

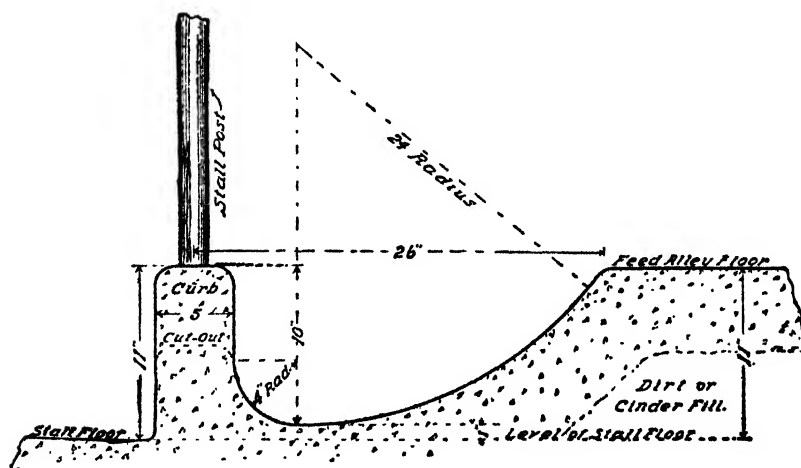
It is a custom very generally practised to have the top 2 ft. of the standing laid in clay or chalk for the purpose of providing a softer flooring to take the cow's knees. This, I need hardly say, makes it extremely difficult to keep the stall in what is called a sanitary condition, whilst on the other hand I have never found the cement cause enlarged knees, at all events not when some form of bedding, preferably straw, is used. During the summer when the cows are out no bedding is, of course, required, and it will be readily seen how easy it is to keep the stalls sweet and clean.

#### ROOFING.

This may be in tiles, slate, corrugated iron, or the new material called Poilite, made of asbestos by Bell's Asbestos Company. Whilst there is probably nothing superior to tiles, they have the disadvantage of being heavy, and therefore require the building to be of more substantial, and consequently more costly, construction. In my own case I used galvanized iron, and helped to equalise the temperature by



MANGER WITH FOOD ALLEY FLOOR SAME LEVEL AS COW STALL.



MANGER WITH FOOD ALLEY FLOOR RAISED ABOVE COW STALL.

lining the same on the underside with match-boarding. And here may I throw out a hint to my Devonshire and Cornish friends in reminding them that complaints are made that the beautiful scenery which makes the two counties so attractive to visitors is being marred by the increasing prevalence of galvanized roofing. My suggestion is that this unsightliness would be very much mitigated by giving the galvanized-iron roof two coats of red oxide paint, which, when toned down, would render the roof less conspicuous. Moreover, the cost would be repaid by the increased endurance of the roofing.

The asbestos tiles are very light, and if fixed to close boarding with a layer of felt between the boards and the tiles would provide a light roof that would maintain an equable temperature. If putting up a new house or recovering an old one, I should myself be inclined to try this.

#### LIGHTING AND VENTILATION

If possible, both sides and ends should be taken up with windows, leaving only sufficient brickwork to form the piers to carry the roof. The windows should be 4 ft. 3 in. in height, with the top part of about 18 inches, or 2 ft. if preferable, made to open, either hinged at the bottom to open inwards, or at the top to open outwards, the lower portion of 2 ft. 9 in. remaining a fixture.

The window sill in this case will come at a height of 3 ft. 9 in. or 4 ft., and this should also be in cement, made on a slope so as to prevent the accumulation of dust and the leaving of odds and ends about.

It is needless for me to point out the importance of providing an efficient means of ventilation. There are various means of effecting this. In my own cow-house, in addition to the windows I have a 6-in. board immediately below the eaves, which, as soon as the cold weather is over, is taken away altogether, thus affording additional ventilation.

Roof ventilation should be provided, either by raising the ridge a few inches above the main roof or by means of three or four air shafts let into the ridge.

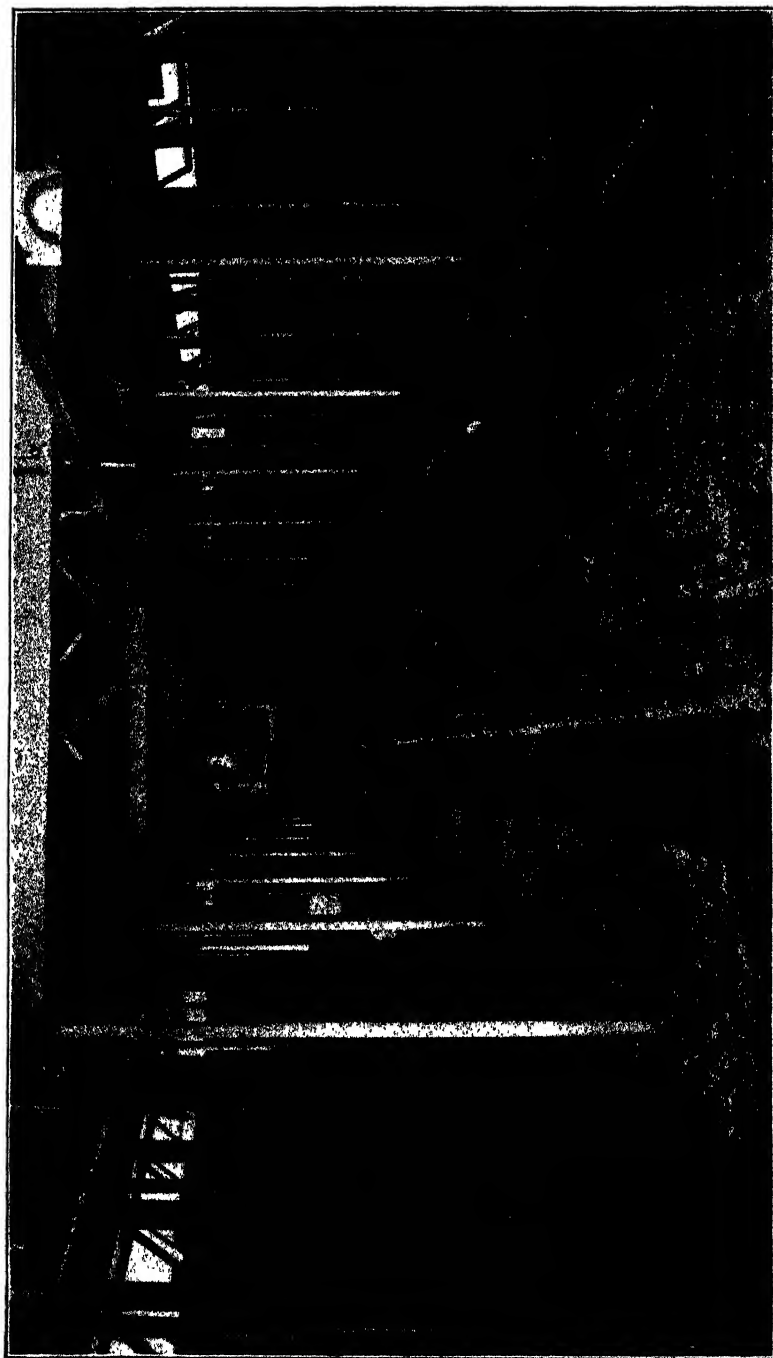
#### THE STALL.

The stall should have a fall of 1 in. from front to back and the back gangway 1 in. from the wall to the gutter.

The standing for the cows is shown on the illustration as 5 ft. 3 in. in depth, but this, of course, would vary according to the size of the cow. Taking the average Shorthorn cow I would advise that this should be from 5 ft. 3 in. to 5 ft. 6 in., and for Jerseys 4 ft. 6 in.

The width of the stalls, like the depth, varies according to the size of the cow. For very large Shorthorns it would be 4 ft., but as a general rule 3 ft. 6 in. is a very good width, and for Jersey cattle 3 ft. would be sufficient.

The rails, which should be of 1½ or 2 in. barrel, outside measurement, and galvanized, should be fixed into the concrete at least 6 in. deep, and may be joined together in the usual way by L and T pieces. In my own case, the irons for an entire standing of 13 cows were all put together before being embedded in the concrete.



INTERIOR OF RE-MODELLED COW-HOUSE

The dividing rail should be 3 ft. 6 in. from back to front, and 3 ft. 9 in. high. This is best made with a double bend, as shown in the illustration, with the highest portion 3 ft. 9 in. from the floor, going down in the bend to 2 ft. 4 in. This enables the cow to turn round more readily when leaving the stall, without having to back into the gutter. In a standing having a dividing rail 3 ft. 6 in. deep there thus remains 1 ft. 9 in. between the division and the gutter.

I think there can be no question that the bars are eminently preferable to the solid or closed divisions, because the floor space being continuous there is very little trouble in keeping it clean, and as there are no separate compartments there are no corners or recesses in which dirt can accumulate. Moreover, the principle of having steel tubing without any obstructive partition between the stalls allows of the free access of sunlight and air from all sides.

#### THE GUTTER.

Mr. McConnell recommends that the gutter should be 2 feet wide. This view is the result of his great practical experience. At the same time I have myself found 1 ft. 9 in. sufficient. The lesser width renders it the more easy for the cows to step over, and they run less risk of slipping down than if they had to step into the gutter itself. The depth on the standing side of the gutter should be 7 in. at least, and it should have a fall outwards of  $\frac{1}{2}$  in., with a drop of 4 in. below the gangway at the back. The fall in the run of the gutter should be 1 in. to every 8 ft. There should be no gullies inside the buildings, all channels being carried outside.

It will be seen that in a length of 100 ft. the gutter must be very much deeper at one end than at the other. This can be partly avoided by making the floor fall to a certain extent with the gutter, and it would be also lessened by making the outlet for the gutters in the middle of the building, the two channels falling towards the middle, thus reducing the varying depth.

#### THE MANGER AND FOOD TROLLEY.

With the cow-house having a centre gangway the manger would be on either side. It would be continuous and thus be swept with the greatest facility. Some people would prefer that a division be put in the manger for each cow. This is arranged for by our American friends by having galvanized-iron plates fixed to a swivel on the upright iron bar, and when the necessity arises for cleaning the manger the plate is raised. On the other hand, where the practice is to feed mashes, as in Scotland, then possibly there is no better manger than the separate glazed earthenware troughs, which are adopted throughout Ayrshire.

The food trolley is brought from the food mixing department on the overhead rail and the cows fed on both sides of the gangway. A wooden carrier 5 ft. long, 3 ft. 2 in. deep, 3 ft. wide at top, and 2 ft. 9 in. at bottom, with one end open and a slant at the bottom, has, in my own case, been found to answer admirably for the purpose. The angle-iron to carry the trolley should be 4 in. by 3 in., hung to iron holders fixed to the roof girders.



#### WATER SUPPLY.

This is always a rather difficult matter, and I agree with Mr. McConnell that a perfect system yet remains to be discovered. I have, however, had in use for many years iron water tanks for each pair of cows, about 2 ft. by 1 ft., kept automatically supplied by means of a ball valve in a small cistern at the end. The supply pipes to this should be large—about  $1\frac{1}{2}$  or 2 inches—and entering the water tank from below. If the pipes are large my experience is that they rarely get choked, and by means of a plug at the ends are easily cleaned from time to time.

In the new house I have installed a trough in which a small aluminium cup is placed over the inlet, which is so well balanced that when there is no pressure of water coming in the cap fits down over the water hole, closing it and preventing food or accumulation from getting into the water pipe.

Probably the best way of all for watering the cows, however, is, in the case of continuous mangers, to turn on the water twice a day, filling the troughs, and when the cows are through drinking, to let the water off. Thus, at the same time, a fine opportunity is afforded for washing and cleaning out the trough.

#### THE STANCHION.

I have here a sample of the stanchion, of which I have now had two years' experience, and which seems to be in very general use in the United States. Some of you will recognise it as an adaptation of the old wooden stanchions such as are still prevalent in many of the cow-houses in this country, and possibly in some in this immediate neighbourhood.

It is claimed that the stanchion keeps the cow better lined up to the gutter, prevents the waste of food by holding the head of the cow far enough over the manger to make the scattering of the ration difficult, whilst it allows of the cow licking herself freely while in her stall. The fixing and releasing of the cows is also very quickly done.

#### ADJACENT DEPARTMENTS.

You will not expect me to go into other departments of farm buildings, but I should like to say this, that the food store and food mixing room should be at one end of the cow-house and the manure pitch at the opposite end. The ideal form would be to erect the cow-house on sloping ground with the food department at the higher end and the manure at the lower. It is a practice in America to run the manure on the overhead trolley so as to tip it direct into a manure distributing waggon, and to draw this direct into the field, but as to the working of this system I have had no experience.

It will be obvious that the most convenient place for the milk-cooling room or dairy would be on one side of the cow-house, about midway, and perhaps adjoining could be placed the room in which the men's working clothes are kept. It would be desirable to arrange for the milk cooler to be placed at a sufficient height to enable the water running to waste from the cooler to be utilised both for washing down the shed and for watering the cows.

**RE-MODELLING OF OLD BUILDINGS.**

By far the larger number of cases where any improvements are required will be in those of existing buildings, and I would strongly recommend that where a suitable main structure exists it should be made available. In such cases the first cost will probably be the cheapest, viz., to take out the whole of the floor and fittings from side to side, using cement and iron barrel in the manner described for new buildings.

Some trouble will be experienced by reason of most of the buildings being erected of wood, generally with stout quartering on the inside and weather boarding on the outside. In my own case, enamelled iron sheets were obtained, each 5 ft. by 3 ft., which were fixed on the walls from the mangers to the windows by screwing them on to the quartering and then having a 1½-in. enamelled iron plate to cover the joints. They were of a pale green colour with a border. This colour, as you know, is a restful one to the human eye and in all probability to the bovine eye also. It has formed an impervious surface for washing and has worn remarkably well. I may add that in this case the cows' heads were against the wall.

With regard to the lighting of the renovated shed, as at present existing these are generally dark, and I would strongly recommend, therefore, that four or five of the top weather boards immediately below the eaves be taken off and the space filled up for the entire length with glazed frames about 18 in. or 2 ft. deep, hinged at the top to open outwards or at the bottom to open inwards. By this means good light and ventilation will be obtained.

**CONCLUSION.**

I fear you will think that my proposals are somewhat a departure from generally accepted ideas, but if we bear in mind that the local and sanitary authorities are clamouring for greater powers of inspection and control over cow-houses, and that when these are obtained a higher hygienic standard will be demanded to which the dairy farmer will be compelled to conform, I venture to think that you will come to the conclusion that the suggestions I have made embody in the main as economical a means as any other system of meeting these increased requirements, and that their adoption will result in the saving of labour and attendance, in the promotion of cleanliness, and in making for the increased comfort and health of the cows, whilst they would certainly give greater satisfaction, if less entertainment, to the inspecting sanitary committee, than the methods adopted by the dairy farmer of whom we read recently who, in anticipation of a visit of the sanitary authorities, installed a piano in his cow-shed, carpeted the floor, and decorated the walls with pictures and other adornments.

## THE REARING OF CALVES ON SUBSTITUTES FOR MILK-FAT AND MILK.

By BERNARD N. WALE, B.Sc. (Agric.).  
Principal, Seale-Hayne College, Newton Abbot, Devon.

OWING to the present high price of new milk in this country and to the production of cheese, cream, and butter at remunerative prices, the use of whole milk for calf rearing, for any length of time, is much too costly a practice; and as there has been a good deal of experimental work carried out in various parts of the world with separated milk and milk-fat substitutes, which have proved highly satisfactory, I propose summarising the most important results.

As to rearing calves altogether, without some portion of separated milk, *i.e.*, on milk substitutes pure and simple, there is considerably less information available, this, however, will be referred to later.

As we heard at the Dairy Conference in Ireland last year, and as is generally recognised, the heavy milking cow is *bred* and not *made*. Heifers descended from heavy milking dams are far more likely to turn out heavy milkers themselves than when descended from poor milking strains; and it is most regrettable, from the point of view of the Dairy Industry of the future, that many of these well descended calves are disposed of as soon as dropped, either to be vealed, or, as in too many cases, to be subsequently converted into beef. It is because of this fact that I bring forward the suggestions contained in this paper, hoping that perhaps, where calves have been disposed of heretofore, as just mentioned, it may seriously be considered whether some of them at least cannot be retained at home and economically reared, to be later brought into the dairy herd.

This treatise does not pretend to be exhaustive, as time will not allow of dealing with so large a subject at such length as it deserves.

There are on the market numerous proprietary calf meals varying in price from £13 to £20 per ton, and which are, from their contents, as revealed by analysis, much too expensive. These meals contain linseed, linseed-cake meal, and oatmeal, with a little fenugreek or fennel added, which gives them their characteristic odour.

It is not so difficult a matter to find a fat or milk substitute for calves of a similar chemical analysis to that of milk, but it is difficult to do so without introducing also a large amount of fibrous matter, which is liable to upset the delicate digestive tract of the calf, resulting in scour. And if it escapes this scourge, we get a final result which is quite characteristically described as "pot-bellied," a condition which is the very opposite to that which a properly nourished calf should present.

I should here like to acknowledge my indebtedness for some of the information contained in this paper to the Irish Department of Agriculture, the Agricultural Department of Leeds University, Aberdeen University, and to other stations, which will be referred to in their place. The figures I give will not be exactly those found in the reports compiled by these bodies, as it has been necessary to make fresh calculations on other bases, in order to make the experiments of these institutions comparable with one another.

In the experiments referred to, the calves have been kept under observation, not only during the rearing period, but also up to the time they reach  $1\frac{1}{2}$  to  $2\frac{1}{2}$  years of age, so that the influence, if any, of the early feeding, could be gauged.

I would like to draw your attention, in the first place, to the experiments carried out by the Agricultural Department of the Leeds University. These experiments had for their object the demonstration of rearing calves on separated milk and cod liver oil. The results are given below and they represent the conclusions obtained from *five* series of experiments carried out at the Garforth Farm during the years 1899-1903, with more than 50 calves. The whole milk was valued at 8d. per gallon and the separated milk at 2d., and cod liver oil at 5s. per gallon. For comparison the returns on valuing whole milk at 6d. and separated milk at 1d. are also included.

#### SUMMARY OF LEEDS UNIVERSITY EXPERIMENTS IN CALF REARING.

Number of calves . . . . .	Lot 1.	Lot 2.
	23	29
Foods . . . . .	Whole milk.	Separated milk and cod liver oil
Age of calves at start, in weeks . . . . .	6	6
"    "    weaning, in weeks . . . . .	24	24
Average weight of calves at start (lbs.) . . . . .	132	132
"    "    "    weaning (lbs.) . . . . .	359	305
Average increase for experimental feeding . . . . .	227	173
Average cost of experimental feeding... . . . .	£6 5 0	£2 3 3
Average cost per lb. of increase . . . . .	6'94d.	3'03d.
Average live weight (lbs.) when sold fat at $2\frac{1}{2}$ years . . . . .	1,193	1,152
Value per head, 60s. 8d. per cwt. dead weight . . . . .	£18 13 3	£17 17 8
Balance, after deducting cost of experimental food . . . . .	£12 8 3	£15 11 0
Balance in favour of separated milk and fat substitute . . . . .	—	£3 2 9
Balance if whole milk is valued at 6d. and separated milk at 1d. . . . .	—	£2 12 1

It will be seen that there remains as balance a very appreciable sum in favour of separated milk and cod liver oil over whole milk, viz. :—  
 £3 2 9 with whole milk valued at 8d. and separated milk at 2d. per gall.  
 and £2 12 1 " " " 6d. " " 1d. " "

In addition to the foods mentioned, all calves received a gradually increasing quantity of a mixture of equal parts of bran and linseed cake during rearing, until at weaning this had increased to  $1\frac{1}{2}$  lbs. per head daily.

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The next experiments I refer to are those carried out by the Department of Agriculture for Ireland during the years 1901-1903, consisting of three separate series, with a total of 54 calves divided into three lots.

				Lot 1.	Lot 2.	Lot 3.
Number of calves ... ..				19	17	18
Foods ... ..				<div> <div>Whole milk</div> <div> <div>Separated milk and cod liver oil.</div> <div>Separated milk and meal mixture*</div> </div> </div>		
Average age in weeks of calves at start ... ..				4½	5	5
Average age in weeks at weaning ... ..				23	23	23
Average weight of calves at start (lbs.) ... ..				119	124	129
Average weight of calves at weaning (lbs.) ... ..				427	381	404
Average increase for experimental feeding (lbs.) ...				308	257	275
Average cost of experimental foods ... ..				£7 7 0	£2 13 7	£2 10 4
Average cost per lb. of increase				5·72d.	2·50d.	2·19d.
Average weight (lb.) when sold as stores at 18 months ...				830	768	771
Value per head at 25s. 2d. per cwt. live weight ... ..				£9 7 7	£8 13 2	£8 12 4
Balance, after deducting cost of experimental foods ...				£2 0 7	£5 19 7	£6 2 0
Balance in favour of separated milk and fat substitutes. .					£3 19 0	£4 1 5
Balance if whole milk valued at 6d. and separated milk at 1d.					£3 4 8	£3 7 3

In these experiments again it will be seen that very economical results have been obtained in feeding, separated milk and fat substitutes.

Each lot of calves also received linseed cake as soon as they would eat it, in small quantities at first, but gradually increased, so that at the time of weaning they had 1lb. per head daily.

The Department of Agriculture for Ireland were so satisfied with the results of feeding with this meal that they now recommend it to Irish farmers as a standard milk-fat substitute.

The following experimental results were obtained by the N.E. of Scotland Agricultural College at Aberdeen from 1908-1911, with three series of experiments on 44 calves in all, divided into three lots. The object here being to compare the value of cotton seed oil with cod

<p>*The meal consisted of</p>	<p>{ 1 part ground linseed 2 parts maize meal 2 parts oatmeal</p>	<p>{ This meal was mixed with sufficient boiling water to make a thick gruel and allowed to stand 12 hours before being fed along with the separated milk.</p>
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The milk was run through the separator immediately after milking, and the separated milk fed to the calves soon after.

The oil was measured out for each calf in fluid ounces, and poured into the apportioned quantity of separated milk in the bucket and well stirred.

In other experiments it is recommended that the oil be first put into the bucket, the proper quantity of separated milk poured upon it, and then well stirred; this ensures thorough mixing.

The oils were gradually introduced, commencing with one fluid ounce. The weighed quantity of meal for the whole lot of calves was made into gruel with hot water, and a measured proportion of this gruel given to each calf when it was cool, along with the separated milk.

The daily quantities of the experimental foods per calf were those fed under average conditions, and as they form a useful guide in general practice they are here reproduced.

#### EXPERIMENTAL FOOD PER CALF.

##### *Lot I. Whole Milk.*

1st four weeks of experiment	...	...	1	gall	whole milk	daily.
2nd, 3rd, and 4th four weeks of experiment			1½	galls.	"	"
5th four weeks of experiment	...	...	1	gall.	"	"

##### *Lot II. Cod Liver Oil.*

		Whole Milk.	Sep. Milk.	Cod Liver Oil	Meal.
1st week of experiment	...	¾ gall.	¾ gall.	—	2 oz. daily.
2nd "	"	¾ "	¾ "	—	4 "
3rd and 4th weeks of experiment	...	1 "	1 "	1 fluid oz.	4 "
2nd four	"	—	1 "	2 "	6 "
3rd "	"	—	1 "	2½ "	6 "
4th "	"	—	1 "	3 "	6 "
5th "	"	—	1 "	3 "	4 "

*Lot III. Cotton Seed Oil.*—Same as Lot II., except that cotton seed oil was used in place of cod liver oil.

It is not to be assumed that the fat substitutes mentioned in the three lots of experiments just recorded are necessarily the best it is possible to obtain.

In Leaflet No. 142 of the Board of Agriculture and Fisheries, the following are recommended—in addition to cod liver oil.

- (a) Boiled linseed.
- (b) Ground linseed.

Ground linseed cake is also referred to, but it is correctly pointed out that ground linseed cake is not sufficiently rich in oil to make up the requisite amount of fatty matter when added to separated milk.

Further, in America much calf rearing is done and recommended by the Department of Agriculture in the form of feeding the separated milk and meal separately. The meal is given to the calves in the dry condition, the calves are taught to feed when from 7 to 10 days old.,

by placing a little of the grain in their mouths after feeding the milk, and in this way their attention is called to the meal instead of sucking each others' mouths, ears, etc. They soon learn to eat the meal greedily.

The Department state clearly it is not advisable to mix any starchy meals with the milk. The starch of the meal is intended to take the place of the fat of the milk, and its form must be changed to sugar before it is digestible. This change is largely effected by the saliva of the mouth. If the grain is gulped down with the milk, there is no time for the saliva to act, hence intestinal troubles follow.

The recommendations of the Kansas Experimental Station, U.S.A., are: that separated milk can be introduced gradually (1 lb. separated milk substituted for 1 lb. milk until all the latter is replaced) when the calf is 14 days old.

At 7-10 days age the calf is taught to eat grain as described above. The grain which gave the best result was a mixture of Kaffir corn (millet) ground and whole maize. As Kaffir corn forms the chief diet of some millions of human beings, it is not to be wondered at that it makes a suitable food for calves.

Maize fed whole proved better than when fed as meal, while Kaffir corn fed as meal gave the better results than when fed whole. The grain was given in amount averaging 1 lb. per head for the whole rearing period of 17 weeks.

The results obtained with 130 calves, divided into 13 series, gave an average daily gain in live weight of 1.58 lbs., against the Yorkshire 1.37 and the Aberdeen 1.27 daily gains with separated milk and cod liver oil.

I have been informed by the Secretary of the Irish Department of Agriculture that experiments are in progress in Ireland on the subject of feeding starchy meals to calves in the dry condition, but up to the present there seem to have been no experiments carried out in Great Britain in feeding the meal which forms the fat substitute in the dry state, with one exception; yet in America it would appear to be the almost universal custom in some States.

The exception in Great Britain, where meal has been fed in the dry condition, is in the experiments carried out by Dr. Voelker for the Royal Agricultural Society at Woburn during 1912-13. A report of which has been furnished to members of the above Society.

In these experiments there were five lots of calves, consisting of four calves in each lot. The foods fed were as follows:—

- Lot I. Separated milk and Cod Liver Oil.
- „ II. Separated milk and a purchased "Calf Meal."
- „ III. Separated milk with a gruel made of Linseed and Oatmeal.
- „ IV. Whole milk.
- „ V. Separated Milk and Crushed Oats.

The report states: "It is of importance to note that the crushed



oats were always given *dry*, and never mixed up with the milk or made into a gruel."

That the feeding of starchy meals to calves in the *dry* state is very satisfactory under English conditions also, is proved by the results obtained in these Woburn experiments, which were as follows :—

<i>Lots.</i>	Average Gain per Head daily in lbs.		Average Cost per lb. of Increasc.	
<i>I.</i>	.....	1·90	.....	3·33d.
<i>II.</i>	... ..	1·75	.....	2·77d.
<i>III.</i>	... ..	1·57	.....	3·45d.
<i>IV.</i>	.....	2·00	.....	5·39d.
<i>V.</i>	.....	2·19	.....	2·52d.

Experiments carried out in Italy\* at the Royal Agricultural College, Milan, during the years 1905-11, with 116 calves fed with margarine emulsified in separated milk and starch treated with a ferment (*a*) diastoline extracted from malt, or (*b*) levuline (used by bakers for bread-making in Italy), have given excellent results, but the calves were fed for veal, and the after-influence consequently could not be gauged. Still it points to the possibility of using margarine, which in bulk may be obtained from 50s. to 60s. per cwt. It, however, requires some considerable amount of preparation; an emulsifier must be used to thoroughly disseminate the melted margarine throughout the separated milk.

The simplest solution of making up the separated milk in fat contents seems to lie in the employment of a suitable animal or vegetable oil which can be easily mixed with the separated milk, and obtained at a price of not more than 5s. or 6s. per gall. The cotton seed oil which gave such good results in the Aberdeen experiments costs 2s. 7d. per gall., and it was pointed out that its use was accompanied by no ill effects. It may be noted also that it is largely used for food purposes for human consumption at the present time.

It is very important in using cod liver oil to see that it is fresh and not rancid, as there have been cases of mortality when rancid oil has been fed to calves.

In the Kansas† experiments above referred to, tests were carried out with *milk substitutes*, entirely replacing the whole milk, such as—

(*a*) BUTTER-MILK, with Kaffir corn and whole maize fed dry, the calves were fed for 18 weeks, 10 calves on separated milk and corn and 10 on butter-milk and corn.

The butter-milk calves increased on an average 1·79 lbs. daily and the separated-milk calves increased on an average 2·02 lbs. daily.

Although the butter-milk did not give such good results as the

\* Monthly Bulletin of Agricultural Intelligence and Plant Diseases. August, 1913.

† Bulletin No. 126, May, 1904, Kansas State Agricultural College.

separated milk, yet the gains are very satisfactory and point distinctly to the advisability of using butter-milk in the absence of separated milk, and where the former is produced at home or somewhere in the neighbourhood. It would appear from the experiments that the butter-milk was gradually introduced to displace whole milk when the calves were three or four weeks old, by substituting one pound at a time, as was the case with the separated milk.

(b) **WHEY.**—Whey, unlike separated milk, is not whole milk minus the fat only but minus the casein as well.

Whey was introduced gradually with calves aged from three to five weeks and a mixture of Kaffir corn and sifted oats fed dry, with as much meadow hay as the calves would take. It required two weeks to completely displace the whole milk. One to one-and-a-half gallons of whey were fed daily, but the calves needed watching and the whey was withheld if any tendency to scour showed itself. The grain, however, seemed to counteract this tendency. No records are given as to the final weights, but it is remarked that the calves at the end of the experiment looked as well as the average separated milk-fed calves on the farm. One cannot see why cod liver or cotton seed oil added here should not have given even better results.

(c) **HAY TEA.**—Made by steeping hay in a copper of water and then boiling for one to two hours until 12 lbs. hay produced 100 lbs. tea. The tea was then fed in quantity similar to separated milk.  $\frac{3}{4}$  lb. of linseed meal was fed after making into a jelly along with the hay tea. Hay was fed *ad lib.* and Kaffir corn and middlings fed dry. The gains in live weight were less than 1 lb. daily, viz.: '86 lb., and altogether the results showed hay tea to be unsatisfactory. It is a fact, however, that many calves have, in time past, been reared in England with a certain amount of hay tea, but as no statistics of live weight gains are available it is impossible to say whether they made satisfactory progress.

The last lot of experiments I wish to call your attention to are those carried out by Cornell University, 1907-1909.\* After a satisfactory preliminary experiment with 15 calves, another set of 17 calves were divided into three lots.

*Lot 1* was fed separated milk and dry grain, the calves were fed all the dry grain they would clean up daily. It was mixed as follows:—

- 6 lbs. maize and oats (ground half and half by weight).
- 3 lbs. wheat bran.
- 1 lb. linseed meal.

Hay was kept before the calves at all times. Both the hay and grain were weighed daily for each animal and in addition each calf was

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\* Bulletin No. 269—Substitutes for Skim Milk in raising Calves, July, '09, Cornell University—Department of Agriculture.

given a tablespoonful of dried blood meal, but no charge has been made for this small amount. It was advertised as preventing scour and seemed to act as a tonic generally.

*Lot II* received separated milk powder. The separated milk powder was simply ordinary separated milk dried by a patent process and delivered as a fine meal. It cost just over a 1d. per lb. and was prepared for feeding by adding 9 lbs. hot water to each 1 lb. powder.

*Lot III* were fed with gruel made from Schumacher Calf Meal. This is a commercial product of the Quaker Oats Co., Chicago, and contains oatmeal, oat germ, wheatmeal, linseed, and condensed milk and cost 1½d. per lb. This was fed as follows: 10 days to a fortnight old, whole milk; then two tablespoonfuls of meal to 1 pint boiling water, and 2 quarts milk were given night and morning. The meal was gradually increased, until, at the end of 14 days, the calf received at each meal 1 quart whole milk,  $\frac{3}{4}$  quart of meal mixed with 1 pint cold water, and then 1 quart boiling water. Afterwards the feeding was as below:—

#### DIRECTIONS FOR FEEDING SCHUMACHER CALF MEAL.

Age of Calf.					Quarts Water.		
					Warm.	Boiling.	
7- 14 days	...	1	...	$\frac{1}{2}$	...	1	
14- 21 "	..	1	..	$\frac{1}{2}$	..	1	Twice daily.
21- 28 "	..	$\frac{1}{2}$	..	1	..	1	
28-120 "	..	No milk	..	1	..	1½	

The details of the experiments were as follows:—

	<i>Lot I.</i>	<i>Lot II.</i>	<i>Lot III.</i>
Number of Calves ..	7	6	4
Foods .. .. .	Separated milk and grain	Separated milk powder	Schumacher calf meal.
Age of Calves at start ..	<div> <div>&lt;</div> <div>birth</div> <div>&gt;</div> </div>		
Average age in weeks at weaning	22	22	22
" weight (lbs.) of calves at birth .. .. .	73	69	64
" " " weaning .. .. .	301	252	227
" increase for experimental feeding .. .. .	228	183	163
" cost of experimental feeding .. .. .	£2 10 5	£2 8 0	£2 14 0
" cost per lb. of increase ..	2·65	3·14	3·97
" gain in lbs. per head daily	1·53	1·23	1·10

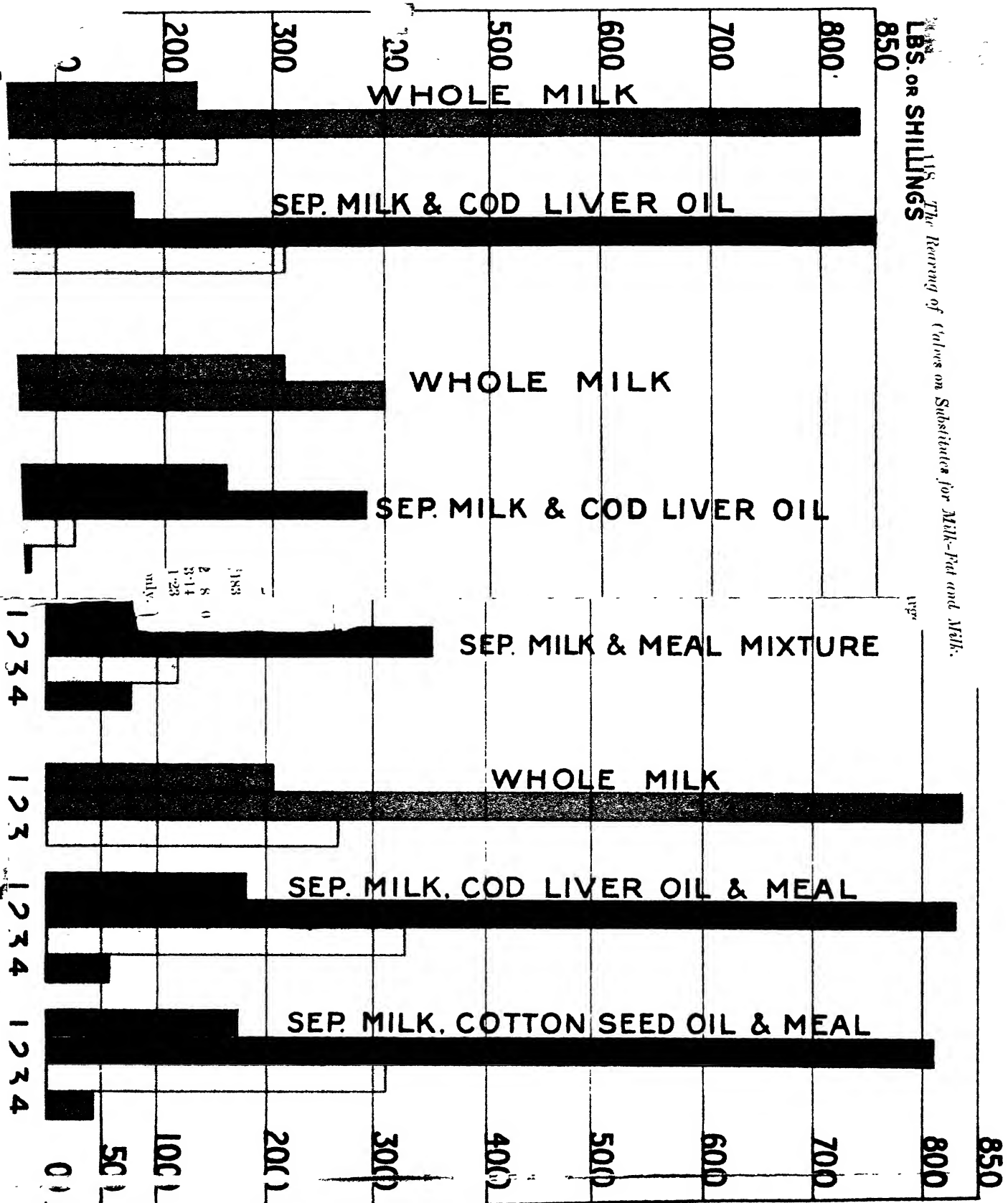
*Lot I.*—Consumed 20 galls. per head of whole milk only. } Before being fed  
*Lot II.* " 18 " " " " " " } entirely on the  
*Lot III.* " 22 " " " " " " } milk substitutes.

The calves thus reared were kept to be brought into the dairy herd, and although weights are not given showing their later rate of increase in live weight, it is reported that the animals of the different lots appeared to possess equally good constitutional vigour.

It will be noticed that the cost per lb. of live weight increase



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# CALF - REARING EXPTS.

- 1 = INCREASE IN LBS. LIVE WEIGHT ON REARING FOOD.
- 2 = INCREASE IN LBS. LIVE WEIGHT AFTER WEANING.
- 3 = BALANCE (Shillings) WHEN SOLD AFTER DEDUCTING COST OF REARING FOOD.
- 4 = BALANCE (Shillings) OVER WHOLE MILK RATION.

PRICES.  
Whole Milk is valued at 8<sup>d</sup> per gallon  
& Separated Milk at 2<sup>d</sup> per gallon.



was very satisfactory as compared with that made in the experiments already described.

It may perhaps be considered that I have not solved the question of how to rear calves on milk substitutes, as Lot II, though not fed milk in the dry condition, were fed the dry matter of milk, and that the food of Lot III contained at least a little condensed milk. All I can say is that at present there appear to be no really good milk substitutes for calf rearing generally available, but assuming the milk producer makes butter or cheese, he has separated milk or whey to fall back upon, which, as has been shown, can be usefully employed for the purpose; and if he sells all his milk, he can, if procurable, purchase separated milk up to at least 3d. per gallon and raise calves economically on it (and cotton seed oil) even at that price.

Should separated milk powder\* be available at less than 3d. per lb., it would seem to form a fairly economical food on which calves can be profitably raised, if fed with cod liver oil or some food butter-fat substitute.

In conclusion I need only emphasise the importance of strict cleanliness in all matters connected with calf rearing; the scalding of the feeding buckets and other utensils in which the food is fed or stored, lime-washing the walls of the calf-pens periodically, and the use of sufficient bedding material for the calf to have a dry bed at all times. Cleanliness is the chief factor, and because a man finds he is unable to rear calves on milk fat or milk substitutes, which others have found satisfactory, may be due to the neglect of these points and not to any faultiness of the food.

\* This product is now obtainable in England from the West Surrey Central Dairy Co., Ltd., Guildford, and from their branches and factories at Wincanton, Sherborne, and Beaminster.

## SOUTH DEVON CATTLE AS A DUAL PURPOSE BREED.

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By H. J. HANNAFORD, Bailiff at Messrs. W. & H. Whitley's,  
"Primley Farm," Paignton.

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THE South Devon breed is constituted of animals of great aspect, fulfilling in the best possible manner the conditions of dual purpose. There is no doubt that they owe much of their popularity to their well merited reputation of being so well adapted for general purposes, *i.e.*, for the production of both beef and milk. The breed differs from North Devons principally in size: the South Devons are much heavier and slightly lighter in colour than those of the North Devons or Somerset Devons, which breed is usually classed as Devons at the leading shows. South Devons are also far better milkers than the Devons, and for a great number of years have been considered a distinct breed. It is a very old race, which was formed in the south-west of England, and has chiefly been confined to, and in the past little known beyond, its own district of Devon and Cornwall so far as breeding is concerned. They are, however, much sought after and appreciated for grazing purposes in distant counties, where they never fail to give satisfaction and produce the very best quality of beef. In their own district they have held the field against all comers, and where other breeds have been tried from time to time they have, in almost every case, given place to the old habitants. So far as their dairy properties are concerned, where these have been cultivated, the results are eminently satisfactory, and hundreds of dairies may be found in Devon and Cornwall where the dairymen have no wish to change to other breeds. Of recent years a growing demand has sprung up for the exportation to foreign countries, and their advocates believe they only need the one advantage of being better known for this demand to increase to a very much greater degree, as the accounts gathered from their distant homes are all that could be wished. They are greatly esteemed in the Colonies, and particularly in South Africa.

Some observers of the qualities of this breed believe that their great milking capacities are due to a cross with the Guernsey at the beginning of the eighteenth century. Youatt stated in 1834 that the practice of this crossing existed. It is perfectly recognised to-day that the South Devon race is unequalled as an animal destined to fill the double purpose of a producer of flesh and milk, and has been progressively improved with the selection and care of the breeders. The milk gives a high percentage of fat and the butter is of a very rich golden colour. Want of publicity is the great drawback to the breed.



The herds as a general rule are small, and therefore the owners are not warranted in making heavy personal expenditure in advertising as individual farmers, and have not a sufficient number of animals to supply any suddenly increased demand. For the same reason no general effort has been made, until recently, to keep milk records which would be available for intending purchasers, but it is hoped that an improvement is now taking place in this respect, as present market prices are waking breeders up to the fact that their herds are of great prospective value, and the records are of importance. Of the largest and best known herds, and naturally the one I know most of and therefore can talk about, is that owned by Messrs. W. & H. Whitley, of "Primley Farm," Paignton: this herd consists of between 200 and 300 head, and of late years several cows have been exhibited in the Milking Classes at the largest shows. At the present time many of the cows are yielding from 40 to 60 lbs. per day. At Norwich Royal Show, in 1911, Messrs. Whitley's "Daisy" yielded 72 lbs. 6 ozs. of milk in the 24 hours, and at Tring, in August, after being 90 days in milk, she won, in an open class comprising 80 entries and representing the various breeds, with 72 lbs. 2 ozs. of milk, and at the Dairy Show, in October, where her lactation period had been 146 days, she yielded 66 lbs. 5 ozs. of milk, a quantity unexcelled by any pedigree animal shown, and at the Dairy Show, in 1912, on the first day of the test "Cowslip" gave 67 lbs. of milk, and on the second day 70 lbs. of milk. In the milking trials at the Royal Show, in 1913, "Primley Bloom" yielded 57 lbs. 12 ozs. of milk and "Primley Blossom" 51 lbs. 12 ozs., taking a high place for both yield and points among the twelve competing breeds. "Primley Bloom," the cow just referred to, gave during her first period of lactation well over 10,000 lbs. of milk, this being, I would suggest, a remarkable performance for a heifer. Her splendid record was more than well maintained, as during her second period of lactation she gave 10,519 lbs. of milk in 299 days. No attempt has been made to boom these records in any way, and the weighings were openly made, and subject to being checked by any interested person. A further success of note was made by Messrs. Whitley a few years ago at the London Dairy Show, when their cow "Fancy," was awarded the "Spencer" Challenge Cup in competition with all breeds. As a meat-producing breed they are as profitable as any in England. Given even quantity of food the percentage of beef return is as large as can be shown by any other breed, the beef is of fine quality; and as fatteners the South Devons are not surpassed in their own county, and will go from store to fat beasts quickly on good pasture and a little cake or corn. They require no expensive or extensive course of fattening; it is no unusual circumstance to find steers in the Christmas markets with a live weight of a ton or more, and on many occasions that weight has been greatly exceeded by bulls which have figured so prominently in the Royal and other show yards. At Smithfield Show Messrs. Whitley exhibited two steers, which were purchased by a Walthamstow butcher, who reported very flatteringly on them, the average daily gain of one being 2·3 lbs., the other 2·32 lbs.,

and the percentages of dressed carcase to live weight 65.12 and 64.89 amply bear out the claim that South Devons are remunerative both to feeder and butcher. At Newton Abbot Fat Stock Show, held so recently as December last, four steers in one class gave the wonderful average weight of 1 ton 1 qr. 9 lbs. each. The heaviest animal, which I hope you will all find pleasure in seeing soon, then weighing 23 cwt. 2 qrs. 7 lbs. His present weight I will leave you to estimate when you see him.

Messrs. Page & Whitley, of Warren Hall, Broughton, near Chester, who started a herd of South Devons about twelve months ago, write as follows :—

We may say that we have every reason to be satisfied with the way in which these cattle have done here. Owing to alterations to our buildings, which unfortunately could not be completed in the time expected, our herd had to remain in the open and without shelter until well on into the winter; they bore this, in spite of the fact that many of them had only recently come up from the extreme South of England, without apparent discomfort, and no ill-effects of any kind could be observed. They have proved themselves to be excellent feeders, our main difficulty, while they were on grass, being to keep them from putting on too much condition; and their milking properties, bearing in mind the adverse circumstances which we have already mentioned, have been such, we feel, as would do credit to any breed. It may be worth mentioning that during the months of June and July, when we fed no artificials of any kind, the lowest fat percentage of our milk was 3.70 per cent. This figure is the result of weekly tests.

Following are a few records of the cows that have completed their lactation :—

No. 1. Yielded 11,513½ lbs. milk in 370 days.

No. 2. Yielded 9,439 lbs. milk in 228 days.

No. 3. Yielded 13,767½ lbs. milk in 353 days.

These results speak well for the milking capacity of the cattle, but completed records are not yet available for several of our best cows. Naturally our milk records for the second period of lactation will give more satisfactory results.

For instances of cows which have calved with us, but whose total records are not yet available, we can give you :—

(A) 2,358 lbs. of milk in 44 days.

(B) 1,776½ lbs. of milk in 33 days.

(C) 3,258 lbs. of milk in 60 days.

These we think are promising, particularly as B and C are still increasing their daily yield. Two other points which may be of interest,—we have been buying during the last twelve months throughout the county of Devon, and in connection with our purchases have had occasion to submit several animals to the tuberculin test. It is satisfactory, we think, that at a time when the very general prevalence

of bovine tuberculosis has obtained recognition, no more than six animals out of forty-nine of this breed should have given even a doubtful reaction. Further, we may mention that this year we have been selling a few steers in the local markets, and on each occasion our beasts have easily realised the best price. Generally, we may say, as the result of our experience in the North, that these cattle have only to be known in other parts of the country to be appreciated as, perhaps, the best type of dual purpose animal.

The "Herd Book" Society hold sales of Pedigree Stock at Totnes, on the first Thursdays in April and October, and there are usually at least 100 Bulls for sale. During the last twelve months record figures have been made, bulls fetching 100 guineas and upwards, cows and heifers up to 200 guineas. From every point of view South Devons are on the up-grade, and the steady and improving demand for them makes the future full of promise.

## THE PREPARATION AND MARKETING OF DEVONSHIRE CLOTTED CREAM.

By R. ERNEST COCKS, J.P., XL. Dairy, Saltash Street, Plymouth.

I MUST preface my remarks with an expression of regret; for, through an unfortunate misunderstanding, I had no idea of submitting to you any thoughts of my own or any incidents of my experience on a topic of so much importance. But bearing in mind the French proverb that "to excuse oneself is to accuse oneself," I content myself with an expression of the hope that what I shall say may not prove altogether uninteresting, and that as a result of your criticism, it may be brought about that we all shall realise that pleasure and profit have been the result of the time we spend together this evening.

Devonshire cream is universally regarded as a luxury; and rightly so. It finds its way into most unexpected places. In my experience, orders are despatched regularly by post to Ireland, Scotland, Wales, and, I believe, every county of England; and frequently we post cream to France and to Germany; and occasionally even to Canada.

One is often met with the question as to why the cream received by post is not of so good quality as what is obtained at the homestead. And it is no mere fancy of the consumer that a difference in the quality exists. One has to admit the fact; although one is ready to deny the soft impeachment which the question is usually meant to conceal, although to conceal thinly. It is not due to any doctoring or treating on the part of the producer, nor is it due to any strange device of the distributing trader. The cause is manifold, and, doubtless, many of you have observed the reasons which I purpose now submitting; and perhaps you will be good enough to bring to light other reasons known to you which have hitherto escaped my observation.

Firstly, a very large proportion of the cream despatched by post or rail has been obtained by the use of a mechanical cream separator, which removes the fats from the milk rapidly, but seems not to extract the flavour-giving salts, or, if so, only in small quantity.

Secondly, when carried by rail, the cream is subjected to jolting and shaking, the effect of which is that the tiny fat globules are broken; and when broken they lose something of their palate-pleasing properties.

Thirdly, when cream is despatched by the distributor, some time, more or less considerable, has elapsed since the producer first obtained the cream, and time has a deleterious effect, not only on most of us, but even upon cream. It is a perishable article, and the action of the air upon it is not long delayed; consequently, under normal conditions, decomposition is early set up. It is, of course, practicable to

minimise this particular drawback by despatching early direct from the producer to the consumer.

Fourthly, the consignor, usually being other than the producer, has not the same keen interest in securing the very best article which shall command the best price in the open market. In these days cheapness is all the rage, and it is often overlooked that the cheapest article is by no means always the article that costs least to purchase.

On all these grounds, it is a necessity that the cream shall be expeditiously delivered to the consumer, if he is to enjoy anything approaching the luxury of rich Devonshire cream. And, truly, junketing without Devonshire cream is inconceivable.

Much study and careful attention to details are necessary to the production of really good Devonshire cream—and that is the brand par excellence. One must give heed to the hygienic condition of the cowsheds and their surroundings, the choice of the breed of the cattle, the feeding stuffs to be supplied, the careful weeding out of cows that develop undesirable symptoms, the influence of varying climatic conditions; the manner of avoiding all risks of infection through germs or otherwise, whether during the process of milking or of conveying the rich liquid to the dairy. Then, after the dairy has been reached, care must still be exercised. All must be scrupulously clean, and no trace of dust must be found. The dairymaid must have learnt well her lesson of allowing the milk in the pans to settle; and, to secure the "real article," the settled milk must be scalded by steam and allowed to cool gently. It is then, and then only, that patient toil and waiting are rewarded some hours later by the appearance on the top of the milk of the yellow fats in which the milk abounds.

As to the most suitable breed of cattle, while fully recognising that in this district it is impossible to obtain so large a quantity of milk from individual cows as is obtainable in some other localities from individual cross-bred cows, one can unhesitatingly claim that here we have the best "dual purpose" cow in existence. To the keeper of South Devon cattle a regulation that demands a 3 per cent. butter fat standard of milk has no terror. The milk obtained from this breed of cattle is abundantly rich in fats.

As to the quantity of food stuffs, I am not unmindful of the fact that acknowledged experts declare that the food of the cow has but little effect upon the quality of the milk it yields: to some extent the results of my own observations confirm their declaration. Nevertheless, experience teaches me that for the purpose of obtaining milk best suited for the production of Devonshire or "scald" cream, certain kinds of food are to be preferred to others. And, think as you may, experience is a good schoolmaster, albeit the fees are high. In my own practice, I place bran above all other foods. True, it is not at all times and in all conditions of the market, an economical food; but whenever there is a liberal supply of bran to the cattle, the cream obtained from their milk has a pleasant flavour which is found in it under no other conditions.

As to the quality of the milk, I would insist that quality of cream and richness of milk are not to be taken as subsisting together. In fact, an excessively rich milk does not produce cream so nicely flavoured as that which is yielded by milk which contains only from 4 to 5 per cent. of fat. The cream obtained from milk of a higher degree of richness is in my opinion less appetising; but, doubtless, the human race is so accommodating to circumstances, that a taste may be cultivated for even the less appetising cream.

Although you may regard my next point as being prejudiced, coming as it does from a Devonshire man, yet truth will stand. I must be honest with you, so despite what perhaps you may allow me to term your prejudice in thinking it to be universally true, that we never see ourselves as others see us, I claim that scalded cream obtained from milk produced beyond lovely Devon, is not of so high quality as that produced within its charming valleys. The cream of the West Country excels that of the busy North; the fact is plain, whatever be the cause of it. Now let me assume my usual modest vein: not for a single moment would I venture even to hint that the patent fact is due to any superiority in the methods and management of our sturdy Devon yeomen. Far be it from me to harbour such a suspicion. I believe the cause of the admitted excellence is to be found in two factors, namely, the nature of the climate, which though humid is salubrious, and the breed of the cattle, the far-famed South Devons. You will readily admit that the influence of the climate we are unable to transfer to you who come from afar, despite our proverbial generosity, and that the breed of the cattle is within your reach whenever you care to appeal to the true business instinct of the typical Devon cattle breeder. And in passing, let me emphasise the fact, that for young and old, the best tonic that has ever been or ever will be found is the famous Devonshire "junket and cream."

As to hygienic conditions, all know well that scrupulous cleanliness, thorough ventilation and good feeding, are essential to a healthy herd, and all will subscribe to the necessity for every precaution that science and skill can suggest in the production of the milk and in its conveyance to the consumer. The milkers must be scrupulously clean, the cattle must be kept clean, the source of supply of water for cleansing the vessels must be above suspicion of contamination, and dust must be rigidly excluded from the milk. But all these precautions must be taken as well for the production of the cream as for the purity of the milk. The slightest negligence or irregularity in this matter betrays itself at once in the quality of the cream.

As to the preparation of the cream, it will not be news to you that the milk is set in shallow pans for scalding. This is the old-fashioned method in which our dear old grandmothers delighted, and although the scientific attainments of the modern schoolboy often lead him to disdain old-world ways, yet I am convinced that in no other way can the best scalded cream be obtained. I must say a word for our grandmothers, and after all it is a moot question whether there is anything new under the sun.

After the milk has been resting from twelve to eighteen consecutive hours in the shallow pans, these pans containing the milk are placed over a jacketed pan in which passes steam pipes; they remain under the influence of the steam pipes for a period of from fifteen to twenty minutes, by which time the milk is scalded to a temperature of from 160 to 170 degrees. The time occupied both in this process and in the period of rest for the milk, varies with atmospheric conditions, but practice soon qualifies one to judge fairly well, when the critical moment has arrived. Following this scalding process, the pans are removed and allowed to remain at rest until their contents become quite cold. When this stage is reached, the cream, which has floated to the top of the liquid, is removed and may be placed in suitable clean receptacles for local domestic purposes. Vessels made of tin are in common use, but glass or china vessels are much to be preferred. For sending by post, it is obvious that the latter are unsuitable, and tin must be resorted to, as it is light, and easily cleansed.

Let me say that the real secret of making good Devonshire cream lies in the judgment, born of practice, as to the length of time required for settlement of the milk before scalding, and of the time necessary for scalding without overheating. To learn the art there is no golden rule.

In concluding, may I impart to you what perhaps you would never otherwise learn: that, fortunately or unfortunately, I am the possessor of a hide like that of a rhinoceros: nothing will penetrate it. Consequently, I have no susceptibilities for you to wound with any adverse criticisms. I am not unconscious that I have told you little or nothing that is new about the subject of my paper: but as in the multitude of councillors there is wisdom, I invite your candid criticism, and am patiently longing to learn what lessons the discussion may afford.

## THE DAIRY SHOW OF 1914.

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By SAMUEL R. WHITLEY, Rookwood, Shinfield, Reading.

ARRANGEMENTS for holding the London Dairy Show were well forward at the beginning of August (when the thunder-cloud of war burst over Europe), the schedule of prizes was almost ready for distribution, and signs were not wanting that the forthcoming Show was likely to eclipse all previous records. Applications for stands were more numerous than usual at that time of year, and it looked as if the Council's chief difficulty would be to find adequate room for all standholders and exhibits—a difficulty which has been seriously felt at all recent Shows held under the auspices of the British Dairy Farmers' Association.

Some members of the Council, when the full seriousness of the war was realised, had some doubts as to the advisability of holding the Show at all, but by the middle of September, when it was necessary to make the final decision to carry the Show through or to abandon it, it was found that the Council were unanimous in favour of holding the Show, and the decision was the more easily arrived at when it was known that the Board of Agriculture, the Royal Agricultural Society of England, and more especially our worthy President, were strongly of opinion that we should go ahead.

It was impossible to guess at this time what would be the financial result of holding the Show, but it was fairly clear that, owing to expenses already incurred, if the Show were abandoned the Society would suffer a loss well over £1,000.

In these circumstances the decision was not difficult to make, and, as far as the writer was able to ascertain, no one intimately connected with the Show regretted it, and many words of appreciation were heard. The fact is, the London Dairy Show is primarily a great business exhibition rather than a pleasure show, and, curiously enough, though the public attendance suffered, many reported that they had done more actual business at the Show than usual.

It may be well here again to call attention to the altered dates of the Show. As at present arranged, the dates will be as follows:—

In 1915—October 19th, 20th, 21st and 22nd.

„ 1916—October 17th, 18th, 19th and 20th.

„ 1917—October 23rd, 24th, 25th and 26th.

„ 1918—October 22nd, 23rd, 24th and 25th.

„ 1919—October 21st, 22nd, 23rd and 24th.

Under the circumstances, a smaller number of entries was to be expected, and the Council were agreeably surprised to find that, when compared with the entries received about 10 years ago, they show up very well, though materially short of the very high total reached in 1913.



The comparative entries for the past 12 years are given below :—

	1903.	1904.	1905.	1906.	1907.	1908.	1909.	1910.	1911.	1912.	1913.	1914.
Cattle ... ..	203	164	182	240	237	247	232	288	222	210	286	294
Milking and Butter Tests ...	186	167	217	247	245	224	236	264	213	209	265	167
Goats ... ..	30	46	51	51	48	72	84	75	81	105	110	85
Poultry ... ..	2,860	2,678	3,068	3,347	3,081	3,280	2,997	3,259	3,300	3,350	3,840	3,089
Pigeons ... ..	2,485	2,426	2,440	2,573	2,664	2,564	2,282	2,280	2,226	2,456	2,467	2,291
Poultry and Pigeon Appliances ...	—	—	—	53	65	50	37	—	—	—	—	—
British Cheese... ..	269	250	268	255	420	357	355	362	249	343	395	301
Bacon and Hams ... ..	79	46	49	39	57	76	55	104	58	71	89	67
Butter ... ..	555	556	641	578	593	668	535	525	484	618	549	371
Cream ... ..	59	44	52	42	35	47	42	47	26	48	43	27
Skin-Milk Bread, &c. ... ..	83	140	121	139	118	135	115	98	72	83	64	46
Honey, &c. ... ..	125	122	124	118	67	85	88	96	87	95	106	126
Egg and Butter Packages ...	17	20	—	—	—	—	—	—	—	—	—	—
New and Improved Inventions ...	24	43	22	17	33	37	31	34	21	25	41	24
Vehicles for Conveying Milk ...	27	25	—	—	—	—	—	—	—	—	—	—
Roots ... ..	144	184	170	156	177	181	218	196	172	190	190	59
Buttermaking Contests ... ..	150	172	206	199	200	207	120	145	165	165	141	97
Milkers' Contests ... ..	36	55	66	121	135	132	126	122	153	119	137	85
	7,332	7,138	7,677	8,197	8,175	8,362	7,553	7,895	7,529	8,127	8,723	7,069

While it was again impossible to provide a new large ring for judging the cows on Tuesday morning, the slightly decreased entries facilitated the provision of two extra, though somewhat restricted, judging-rings, and all the cattle were judged for inspection before 10.30 on Tuesday morning, thus avoiding "overstocking," and the arrangements were generally considered to be satisfactory.

#### CATTLE.

While the cattle entries were 52 below those of 1913, they exceeded those of 1911 and 1912, and so must be considered very satisfactory numerically, more especially as the class for Island-bred Jersey Heifers could not be filled owing to difficulties of shipment.

At the instigation of the British Holstein Cattle Society, who offered £10 towards the prize money, a class for this breed was started and brought a fair entry, though many were disappointed that the cows did not show up better in the Milking Trials.

Class 1, for Pedigree Shorthorn Cows, brought an entry of 19, which seemed a small number when compared with the 40 odd shown in the same class last year, but the judge reported an excellent lot of cows of good type for both beef and milk production, the first and second prize winners being very nearly equal in merit on Inspection; but in the Milking Trials the second prize winner—Messrs. R. W. Hobbs' "Rose 44th"—carried off the first prize, together with the Spencer Challenge Cup and Shirley Challenge Cup, and was only '1 behind the Red Poll Cow, winning the Barham Cup for the greatest number of points in the Milking Trials.

The corresponding class for Heifers not exceeding three years was well filled with 23 entries, but with no animal of outstanding merit, as far as Inspection goes, although the third prize winner—Messrs. Hobbs' "Sybil 18th"—was able to put up the excellent score of 98.1 points in the Milking Trials.

The class for Shorthorn Cows not eligible for Class 1 was a good one of 26 entries; but, judging from the result of the Milking Trials, they were generally surpassed by their rivals in the Pedigree class. Class 4, for Non-pedigree Shorthorn Heifers, was of average size and quality.

The class for Lincolnshire Red Shorthorn Cows was well filled, and the premier place, both for Inspection and for Milking Trials, was won by Mr. Stanley Blundell, of Welwyn, a comparatively newcomer to the Dairy Show, but neither the cows nor heifers of this breed seem to have distinguished themselves this year in the Milking Trials.

Among Jerseys, the Cow class was a strong one, and represented the very best class of utility Jersey cattle, although many animals had been calved too long to show up to best advantage; in fact, three out of the four mentioned in the Milking Trials had calved before June 2nd, all of them giving about four gallons of rich milk about four months after calving.

The Island-bred class for Heifers was spoilt owing to difficulties of shipping, and the class for Heifers bred in Great Britain and Ireland was none too strong.

Guernsey Cows were about an average class as numbers go and well spoken of by the judge as to quality. A small class of Guernsey Heifers was well spoken of.

The Red Poll Cow class brought but six entries, but the prize-winners for Inspection were of outstanding dairy quality, both owned and bred by Mr. Kenneth Clark, Orford, Suffolk, and both did exceptionally well in the Milking Trials, the winner ("Sudbourne Minnie") gaining the highest number of points in the whole Show by giving about seven gallons of fairly rich milk, thus securing all the premier honours available.

The Red Poll Heifer class brought nine entries of good quality, the winner of the Milking Trials giving close on five gallons in the day.

Ayrshire cattle were this year for the first time restricted to pedigree animals, with the result that they were conspicuous by their absence—London being a great distance from the home of these wonderful dairy animals.

The class for South Devon Cows was a considerable improvement on the corresponding one of last year, some being of immense size and appearing to overtop all the other breeds, but the smaller ones seemed to show more dairy qualities.

The classes for both Dexter and Kerry Cows had to be cancelled owing to lack of entries.

The new class for British Holsteins was rather disappointing, though it produced 11 entries, several of the cows being hardly in show form and too long calved, and they were all below the standard fixed for the breed in the Milking Trials. It is to be hoped that next year's Show will produce a more representative lot of this excellent dairy breed.

Classes 19 and 20, for Cows required for the Milkers' Contests, produced 41 entries, which must be considered satisfactory; the whole were a first-class lot of dairy cattle.

The Shorthorn Bulls of proved dairy ancestry were an exceptionally strong class, and the judge remarked that the first and second prize winners were fit to go into any Shorthorn herd whether for dairy or other purposes.

The Jersey Bulls were few in number, but first-rate in quality.

In the class for Bulls of any other Pure Breed, the judge awarded a Silver Medal both to Messrs. Whitley's representative of the South Devon breed and to Mr. K. M. Clark's representative of the Red Polls.

#### GOATS.

For the past seven or eight years the entries of Goats at the London Dairy Show have steadily progressed, until in 1913 they reached the large total of 110, but this year they fell back to 85, which, possibly may be accounted for by the war. The most noticeable feature of the Goat classes was that the class for Swiss and Anglo-Swiss Goats was not so well supported as in recent years, and the class for Goatlings of the same description had to be cancelled, while that for Anglo-Nubian Goats was unusually well filled, having 17 entries.

The quality amongst Adult Goats was fairly good, but not up to the high standard of 1913, though the Goatlings and Kids were an unusually good lot.

The Milking Trials for Goats were well supported, but produced no very striking results, though the winner in the Milking Trials—Mr. M. E. Mitchell's "*Hawthorne Granite*"—was also first for Inspection in her class; she produced an average yield per day of rather over half a gallon of rich milk.

#### CHEESE.

The entries of Cheese totalled 301 against 395 last year, but last year was almost a record, and, considering the circumstances, the entries must be considered satisfactory numerically, though several of the judges report the quality as hardly up to the usual Dairy Show standard.

*Stiltons* were reported as satisfactory on the whole, but, with very few exceptions, the coats of the cheese were bad and much too tender for handling—in many cases the cheeses were too blue and of such a nature as to go "rank" as they became blue.

*Cheddars*.—The old practice of having one Scotch and one English judge was departed from, two gentlemen with special experience of the London market being chosen, and the result was that judging was considerably expedited and seems to have given general satisfaction. In all the three Cheddar classes the great majority of the exhibits came from the West of England—and the West certainly took its share of prizes—but the two judges unite in deploring the poor quality of the Cheddar Cheese and suggest that perhaps an explanation is to be found in the fact that the War Office had been buying the best cheese in great quantities.

The President, Sir Gilbert Greenall, offered a Champion Cup, value of £10, for the best exhibit of Cheshire Cheese, and the classes were well filled with cheese of excellent quality, one of the judges considering them a considerable improvement on those he last judged at the London Dairy Show. The Champion Cup went to Mr. E. E. Parton, of Tarporley, of which the judge says that the cheese was of a quality, style, and fitness not often approached in the Cheshire Cheese market. The class for Uncoloured Cheshire Cheese was hardly up to the quality of the two preceding classes, and as White Cheese is not a distinguishing feature of the London market, the judge suggests that this class should be abolished and one substituted for 10 cheeses, with a slightly higher prize.

The Lord Mayor's Cup for Cheese was this year offered for the best exhibit of Gloucester, Leicester, Derby, and Caerphilly Cheese, and was awarded to a fine exhibit of Leicester Cheese shown by Mrs. A. M. E. Bowmer, of Barrow-on-Soar. The Leicesters were poorly represented numerically, but spoken of as of very high quality.

The class for Lancashire Cheese was not well filled, but those present were very equal and of fine quality, the judge having difficulty in awarding prizes to cheeses of such equal merit.

In the class for Derby Cheese a good entry was obtained, but the quality was uneven, though the winning numbers were good.

Single Gloucesters were rather few in number, but of fairly good quality and flavour, though some were unripe and others too ripe.

Double Gloucesters were on the whole good and some really excellent, though in general there was room for improvement in flavour.

There were 20 entries in the class for Colonial Cheese, about equally divided between Australia and New Zealand, but New Zealand was able to carry off all the prize money. Unfortunately, several entries were unable to reach the Show owing to war conditions. Of those staged, all the prize-winners were reported as really good cheese, but, in the judges' opinion, three or four exhibits were too stiff in the curd for the London market (notably Nos. 605 and 607), while Nos. 618 and 619 were both made with soft, pappy curd, which would be easily damaged.

The class for Caerphillies brought eight entries, but the judge reports that there was not a single cheese that might be fairly termed a true Caerphilly. The first prize lot was rich and nicely flavoured, but more like a rich scalded Cheddar than the Caerphilly.

Wensleydales were only a small class, and while the prize-winners were good flavoured, mellow, blue cheese, typical of the variety, the others were hardly up to the average at this Show.

Cream Cheese produced a large class, but the quality was rather poor.

The entries of Gervais Cheese were only four in number and rather poor in quality.

Unripened Soft Cheese was a fair entry, and the winning numbers were rich, of good flavour, and nicely put up.

#### BACON AND HAMS.

The entries in these classes were rather less than those of the last two years, though equal to the average of the last 12 years. It was thought that the great demand for Bacon for the troops might account for the entries being materially less than those of last year.

The class for Four Pale-dried Hamless Sides of Spring or Winter Cure contained only four entries, and was a very poor exhibition, lacking flavour and some of the workmanship was only second rate.

In contrast with the above, the same judge reports on the class for Four Smoked Sides, Mild Cured in Wiltshire Style with Ham Attached, as a strong one, the prize-winners gaining close on 100 points.

A new departure was this year made in giving the Colonial curers a class to themselves and allowing entries in this class to compete with the corresponding British class for the British Empire Trophy.

The Colonial entries only numbered three, and the Trophy was again carried off by the Herts and Hitchin Co-operative Bacon Factory, as last year.

The two judges criticise the policy of requiring an exhibit of two smoked sides, two smoked hams, two pale dried sides, and two pale dried hams in these classes on the grounds that the curers who

produced excellent hams failed with their sides, and *vice versa*, but it was the Council's deliberate intention to have an all-round trial of skill in this competition for the British Empire Trophy.

The great majority of the entries in the Ham classes were of excellent quality and very even in points, but the judge found it necessary to disqualify three exhibits in the class for Hams Cured Not Over 10 Weeks, as these had obviously been cured for a longer period.

#### BUTTER.

Compared with the entries of the last 10 years, the Butter staged showed a considerable decrease, which decrease may have been caused by the war, and possibly by the long-continued drought and the consequent increased demand for whole milk. A Champion Class, open only to first prize winners in the last two Dairy Shows, was tried for the first time, and the competitors in this class were not eligible to compete in the subsequent classes. This arrangement was made with a view to encouraging more open and general competition in the ordinary 2 lb. classes, but it will naturally take a year or two for the general run of exhibitors to realise this. The winner in this Champion Class (Mrs. Maurice Bullock, of Wadebridge, Cornwall) was awarded the Society's Gold Medal, and the judge considered this exhibit to be the best lot of butter in the Show.

The Novice Class, open only to farmers, their wives, sons and daughters, occupying 100 acres or less, was a good one, some samples being of exceptional merit.

Class 70, for 2 lbs. of Salt-free Butter, the produce of Channel-Island Cattle and their Crosses, was hardly up to the standard of previous years, and a good deal of inferior butter was present.

Class 71—the same as above, but Slightly Salted—was a better one, and two or three exhibits were of exceptional merit. The corresponding classes, for the Produce of Shorthorn Cattle and their Crosses, were considered good generally, but contained some weak samples.

The samples shown in the class for Butter made from Scalded Cream were all of very good quality.

Class 76, for 2 lbs. Butter in oblong pounds or bricks, shaped with Scotch hands, but without decoration or printing on top of pounds, brought a good entry of well-packed and fair-quality butter.

Class 77, for Butter to be sent by Parcels Post and opened in the presence of the Judge, was good so far as the packing was concerned, but the butter was not of a high standard.

The Elkington Cup, offered for the Best Sample of Butter in the 2 lbs. Classes, was won by Mrs. J. M. Martin, of Stythians, Cornwall, after severe competition.

Only six exhibits put in an appearance for Class 78—24 lbs. in 2 lb. Rolls, Free from Salt, non-returnable packages to be taken into consideration—and four prizes were awarded, the quality being excellent throughout; a similar result was found in Class 79 for 24 Rolls of 1 lb.

In Class 80, for Cured Butter (Slightly Salted), not less than 28 lbs., packages (non-returnable) to be taken into consideration, the quality

of the butter with a few exceptions was good; but in Class 81, for 56 lbs., the quality and flavour were generally indifferent.

Much taste and ingenuity in design were shown by the exhibitors in the classes for Ornamental Butter. The first prize in each class was won by Miss H. M. Trenchard, of Axminster, with exhibits of outstanding excellence.

#### COLONIAL BUTTERS.

In accordance with the desire expressed by some of the Australian representatives, separate classes were offered for Australian and New Zealand Butters, but in the end this new arrangement did not seem to be altogether satisfactory, as many of the exhibitors specially want to know how they stand in relation to their *confreres* of other Colonies, and are glad of this opportunity of competing on neutral ground.

A large number of entries was received in the Australian Classes both for Salted and Unsalted Butter, but unfortunately about two-thirds of each class could not reach the Hall in time to be judged owing to shipping delays. Both judges mention the fact that the exhibits were not thoroughly thawed out, thus rendering judging more difficult. While the exhibits generally were of a high standard, a few were slightly mottled, dull, or muddy in colour. Several samples showed the presence of loose moisture. The chief defects in regard to packing were the use of a dirty-looking vegetable parchment and a poor finish to the butter.

The New Zealand Classes failed generally through shipping delays.

Mr. Poole-Wilson, one of the judges of the Colonial Classes, recommends a uniform scale of points for all the commercial butters, viz., 60 points for flavour, 30 points for texture, 5 points for colour, and 5 points for packing and finishing, thus abolishing special points for salting, and including that important point under the 60 points allowed for flavour. He also recommends covering boxes with a folder having an 8-inch circle in the top, so that only a portion of the butter is exposed to the judge while marking for flavour, colour and texture, thus allowing branded cases of butter to be exhibited just as they would be shown for sale.

#### CREAM.

The entries in the classes for Cream were considerably less than those of the last two years, but equal to those of 1911.

The class for Clotted Cream contained several excellent samples, and the first prize winner was exceptionally good and evidently produced in the original way, being very rich and containing the sweet nutty flavour so much desired by those who know the real article.

Very keen competition was experienced in the class for Cream. Other than Clotted, but two entries had the appearance of being artificially coloured and another was slightly sour.

#### SKIM-MILK BREAD AND SCONES.

Prizes in these classes are offered with a view to encouraging the economic use of skim or separated milk in bread-making, but

unfortunately, numerically at any rate, they have been on the down grade in recent years.

In the class for White Bread the quality was well up to the average, and the first prize was as near perfect as possible. A good class for Brown Bread produced a first prize winner as good as the judge had ever seen. The class for Home-made Bread, excluding bakers and members of their families, brought keen competition, all the exhibits but two being very good.

#### HONEY.

Entries in the Honey Classes constituted a record, and the judge reports one of the finest lots of honey he had ever seen, and especially mentions the display of comb and extracted honey, the excellence of the exhibits rendering the judging no easy matter. Two entries in the Honey Display Class added considerable interest to the general show of honey.

#### ROOTS.

The judge reports a very creditable lot on first inspection, but all the Mangolds and some of the Swedes proved hollow on cutting. The competition in the Mangold Classes was very keen, but the Swedes and Turnip classes were a weak lot.

The judge considers it a mistake that he should be obliged to cut the roots, as this tends to specimen showing, and is not for the encouragement of good farming as field crops are. The feeding properties of a hollow root are as great as those of a sound one, and hollowness is rather a defect to the eye than in reality, and it is not possible for the grower to avoid it.

#### NEW INVENTIONS.

The class for any New Invention relating to the Dairy Industry was a good one, and the judges make specially favourable comment on the Milking Machine of the Wilts United Dairies, in which the objectionable mixing of foul air with the milk is avoided, and also on the Petrol-driven Separator of Messrs. J. S. Miller & Son. In the class for a Self-contained Apparatus for Determining the Acidity in Milk and Milk Products, the judges did not consider the exhibits showed sufficient advancement to warrant an award.

The class for Appliance Designed for Sterilising Milk by Electric Treatment or otherwise, but excluding steam or hot water, produced one entry which proved of considerable interest in the Show, it being a Walkeley's Patent Ultra Violet Ray Steriliser, with a reputed capacity of 200 gallons per hour. Exhaustive tests were made and the milks used were analysed by the Association's Consulting Chemist and Bacteriologist, but the results shown were not sufficiently convincing to the judges to warrant the award of a prize, but upon their recommendations the Council propose, so far as this invention is concerned, to allow it to be again shown in the class should the exhibitor so desire to do.



The class for Milking Pails produced some exhibits of considerable interest, but some of the ideas were considered impracticable and unfit for general utility use.

The Society's Silver Medal was won by Messrs. The Dairy Outfit Company, of King's Cross, N., with a pail having a plain metal cover over the top and a relatively small opening at the side, thus preventing dirt falling into the pail during milking. The judge, however, considered that even this design might be improved by making it with flat sides, so as to ensure better control by the milkers, and by a handle at the top, allowing a better and more handy grip by the milker, most necessary when milking nervous cows.

#### BUTTER-MAKING CONTEST.

The competitors were not so numerous as in previous years, which may be partly accounted for by the exclusion (except for the Championship Class) of the first prize winners in 1913.

The work throughout was of a high-class character, and the judge of the Championship Class specially mentions the expeditious way in which all the competitors finished their tasks.

#### MILKERS' CONTESTS.

In the class open to Men over 18 years very good work was done, the majority being good milkers, and the same remarks apply to the Boys' Class. The work of the Girls was exceptionally good.

The Championship Class was very keenly contested and the work expeditiously done.

The judges recommend that each competitor should have to milk two cows, and three in the final competitions, also that the Society should provide milking stools. They noticed that the cleaning of the udder before milking was often done in a careless manner. It was thought that the Council of the British Dairy Farmers' Association should decide whether "wet" or "dry" milking is the correct method, so that competitors may not suffer through an individual judge's opinion in this matter.

## THE MILKING TRIALS, 1914.

By C. W. WALKER-TISDALE, Northallerton.

THE Milking Trials at the London Dairy Show, 1914, were carried out on the same lines as in previous years. Two features in connection with the standard of points adopted, however, are worthy of note, namely, the raising of the standard for pedigree Shorthorn cows to 100 (in recent years it has been 95) and the inclusion of a class for British Holstein cows, with a standard of 110.

The awards were made from the calculations based on the following scale :—

One point for every 10 days since calving, deducting the first 40 days, with a maximum of 12 points.

One point for every pound of milk, taking the average of two days' yield.

Twenty points for every pound of butter-fat produced.

Four points for every pound of "solids other than fat."

*Deductions.*—Ten points each time the fat is below 3 per cent. ;  
10 points each time the "solids other than fat" fall below 8.5 per cent.

No prize is given to cows in the Milking Trials which do not come up to the following standard :—

	Points (for Cows).
Pedigree Shorthorns .. ..	100
Lincolnshire Red Shorthorns .. ..	100
Non-pedigree Shorthorns .. ..	110
British Holsteins .. ..	110
Jerseys .. ..	95
Guernseys .. ..	85
Ayrshires .. ..	90
Red Polls .. ..	90
South Devons .. ..	100
Kerries .. ..	80
Dexters .. ..	75

The *standard for heifers* in the Milking Trials is two-thirds the points fixed for the cows.

Certificate of Merit and Highly Commended cards are given to all animals, other than prize-winners, that reach the above standards.

A Silver Medal is awarded to the breeder of each first prize cow, heifer, or bull in the Show.

The calculations are based on the average yield of milk for two days, hence are not strictly comparable with the yield of butter in the butter test, which is from one day's milk only. The cows were milked out and stripped on Tuesday evening to the satisfaction of the stewards, and the milk yielded on the morning and evening of Wednesday and Thursday was weighed and averaged.

Samples of both milkings on Wednesday were taken and analysed by the Society's chemist, Mr. F. J. Lloyd, F.I.C., the analyses, together with the average weight of milk, forming the bases of the calculations.

The following table shows the number of animals tested at the 1914 and four preceding Shows:—

Cows.		1910.	1911.	1912.	1913.	1914
Pedigree Shorthorns ... ..		11	13	13	24	14
Non-Pedigree Shorthorns ... ..		16	18	22	10	15
Lincolnshire Red Shorthorns ... ..		8	7	8	7	5
Jerseys ... ..		19	16	9	12	12
Guernseys ... ..		3	1	4	10	6
Red Polls ... ..		7	6	8	6	5
Ayrshires ... ..		2	2	7	4	None
S. Devons ... ..		7	3	6	2	6
British Holsteins ... ..		None	None	None	None	6
Kerries ... ..		3	6	2	5	None
Total ...		76	72	79	80	69
HEIFERS.						
Pedigree Shorthorns ... ..		12	10	3	20	15
Non-Pedigree Shorthorns ... ..		11	7	2	11	10
Lincolnshire Red Shorthorns ... ..		6	6	6	5	4
Red Polls ... ..		7	5	4	9	7
Total ...		36	28	15	45	36
Goats ... ..		13	21	15	23	14

Following the outbreak of the Great War in August, 1914, innumerable show fixtures were cancelled, and it reflects great credit upon the progressive policy adopted by the Council of the British Dairy Farmers' Association which enabled the Show to be held. The Show, despite the circumstances, proved a success, and only in certain sections were entries poor.

A total of 105 cows and heifers competed in the Milking Trials, as against 125 in 1913 and 94 in 1912. Nine fewer heifers were entered, and this, in view of the remarks made by Mr. W. Ashcroft in his report on the 1913 Milking Trials, published in the JOURNAL for 1914, Vol. XXVIII, is satisfactory.

The calculations for each cow are to be found at the end of the Report, and will be studied with interest, more particularly by those who are interested in Milking Trials. No Ayrshires or Kerries competed in the 1914 trials, whilst the new class for British Holsteins, although attracting six competitors, did not prove a success. The standard fixed for British Holsteins, which have undoubtedly come greatly to the fore during the last few years, was 110 points, or the same as for Non-pedigree Shorthorns—the highest standard adopted.

The average points gained by the six competitors was only 80.7, and the highest score by any animal 103.6, hence no award was made. Four of the cows yielded morning milk below the 3 per cent. standard, but even had not the heavy deduction of points which this entails occurred only one animal would have come up to the standard.

From the experience of these results it would certainly appear that 95 is a sufficiently high standard to adopt if the class is scheduled another year.

Five separate tables of figures are given, which will enable a ready comparison of the 1914 with previous results. The tables consist of the following :—

*Table I* shows the standard for each class, the number of cows tested, the number gaining points above the standard, the average points gained, and the average points gained by those above the standard.

*Table II* shows the average number of points gained in each class for the past 15 years.

*Table III* shows the highest points gained in each class during the past seven years.

*Table IV* shows the average quantity and quality of milk yielded by all the animals in each class for the past seven years, 1908-1914.

*Table V* shows the number of animals yielding milk deficient in fat or other solids for eight years, 1907-1914.

The chief honours awarded in the Milking Trials consist of the valuable Challenge Cups, of which the following gives a brief summary and the winners in 1914 :—

*The Barham Challenge Cup* (for the cow gaining the greatest number of points in the Milking Trials) was won by Mr. Kenneth M. Clark's Red Poll cow, "Sudbourne Minnie," which obtained a total of 144.9 points.

This cup was won in 1912 and 1913 by Non-pedigree Shorthorn cows gaining 169.5 and 158.0 points respectively, and the present winner shows a record for Red Polls, the highest score at any of the previous six years' trials being 122.7.

The Milk yield of "Sudbourne Minnie," 19 days calved, was 6½ gallons daily, showing 3.46 per cent. fat in the morning and 3.74 per cent. in the evening.

*The Shirley Challenge Cup*, for the cow giving the greatest weight of milk in the trials, such milk to contain not less than 3 per cent. of fat and 8.5 per cent. of solids not fat.

This cup was won by Messrs. R. W. Hobbs & Sons' Pedigree Shorthorn "Rose 44th," with a total of 144.8 points, the yield of milk being slightly over 7 gallons, showing 3 per cent. fat in the morning and 3.42 per cent. in the evening. This is second to the highest points scored in the Pedigree Class since 1908. The very slight margin between this and the winner of the Barham Cup will be noted.

*The Lord Mayor's Champion Cup*, for the cow gaining the highest points above the standard of her breed.

This cup was won by Mr. Kenneth M. Clark's "Sudbourne Minnie," with the record given under the heading of the Barham Challenge Cup.

*The Spencer Challenge Cup* for the cow gaining the greatest number of points by Inspection, Milking Trial, and Butter Test.

This cup was won by Messrs. R. W. Hobbs & Sons' "Rose 44th," also the winner of the Shirley Challenge Cup—the points she obtained for the Spencer Cup being as follows:—

Milking Trials	..	..	..	144.8	points.
Butter Test	..	..	..	33.0	„
Inspection	..	..	..	45.0	„
Total	..			222.8	

Taking the various classes, the following gives a brief summary of the records:—

**CLASS I.—Pedigree Shorthorns.**—The average points gained by this class are the second best recorded during the past 15 years, being 106.5, which figure was only exceeded in 1910, when the average was 109.5. The figure 106.5 falls only slightly below the average gained by the Non-pedigree class, which was 106.9.

Fourteen cows were tested altogether, and the top cow, with 144.8 points, gained both the Spencer and the Shirley Challenge Cups, and came within an ace of winning the Barham Challenge Cup.

The remarkable improvement of Pedigree Shorthorns as milkers is becoming more noticeable each year. The demand for Pedigree Bulls of milking strain, under the Board of Agriculture Live Stock Improvement Scheme, has doubtless created a big demand for first-class bulls, and there is a shortage in this direction which will encourage breeders of pedigree stock to devote more and more attention to developing the milking qualities of pedigree animals. The average of the whole class was 6.5 points above the standard.

**CLASS II.—Pedigree Shorthorn Heifers.**—The winner in this class, Messrs. R.W. Hobbs & Sons' "Sybil 18th," scored the remarkable record of 98.1 points, but the class as a whole did not come out so well, eight of the 15 heifers having failed to attain the standard points.

**CLASS III.—Non-Pedigree Shorthorns.**—The average points of the 15 cows in this class only exceeded those of the pedigree class by .4, being 106.9. The average points, however, of cows above the standard were 142.5, as compared with 115.1 in the Pedigree Class. The winner, Mr. S. S. Raingill's "Liberty," scored 136.9 points. This is considerably below the highest points gained in this class at the previous trials, in 1912 the score reaching the record of 169.5.

Reserve for the Spencer Challenge Cup went to the cow which came second in this class. As a class, the results were not so good as might have been expected though the cows above standard showed a particularly good average.

**CLASS IV.—Non-Pedigree Shorthorn Heifers.**—Ten were tested and averaged 73.6 points, or .6 above the standard. Of those above standard the average was 83.7. The winner, Mr. J. W. Astley's "Southfield Vivian," gained 97.6 points.

**CLASS V.—Lincoln Red Shorthorns.**—Five cows competed but no one showed outstanding merit. The winner, Mr. S. Blundell's

"Bendish Charm," gained 105·5 points, and the average for the class was 96·3.

CLASS VI.—*Lincoln Red Shorthorn Heifers*.—Four competing gained an average of 67·7 points, the winner, Mr. John Even's "Burton Ruby Spot 11th," scoring 77·2. The average for this class was about the same as for the past three years.

CLASS VII.—*Jerseys*.—The number of competitors, 12, was the same as in 1913, and the average result of 89·8 only ·6 below that of 1913. Only four cows, however, obtained points above the standard, and these averaged 107·1.

The winner, Mr. J. H. Smith Barry's "Heywood Bluebell," gained 112·2 points. This cow (calved on May 20th, or 22 weeks prior to the trials) gave a daily yield of slightly over four gallons, containing 4·99 per cent. of fat in the morning milk and 5·58 per cent. in the evening.

CLASS X.—*Guernsey Cows*.—Six animals competed, obtaining an average score of 85·5 or half a point above the standard. The winner, Mr. A. W. B. Hawkins' "Merton Dairymaid 5th," obtained 99·7 points, beating all previous records for Guernseys for the past seven years. The daily yield of this cow (calved 31 days) averaged slightly under four gallons, the fat in the morning milk being 5·11 per cent. and in the evening 5·62 per cent.

CLASS XII.—*Red Poll Cows*.—Five cows competed, and averaged 127·7 points, all being above standard—altogether a remarkably fine result.

The winner, Mr. K. M. Clark's "Sudbourne Minnie," gained 144·9 points, and her performance has been previously recorded under the heading "Barham Challenge Cup," which cup she won in addition to the Lord Mayor's Champion Cup. She also secured Reserve for the Shirley Cup. The highest points previously gained (1908-14) by a Red Poll were 122·7 in 1912. Second in the Inspection Class, "Sudbourne Minnie" gained equal first for the Red Poll Society Prize.

CLASS XIII.—*Red Poll Heifers*.—Seven competed, and averaged 65·5 points, or 5·5 above the standard, though two failed to attain the standard. The five above the standard averaged 70·1. The general results were much the same as in 1913, but the winner, Mr. K. M. Clark's "Sudbourne Moonshine," exceeds previous records, and, with 98·1 points, equals the remarkably fine record attained by the winning Pedigree Shorthorn Heifer.

CLASS XV.—*South Devon Cows*.—The average of the six cows competing was 108·5, and of the four above the standard 118·0.

The winner, Messrs. Page & Whitley's "Hilda 3rd," gained 133·8 points, with a very creditable performance.

The milk yielded showed a daily average of just over six gallons, the fat in the morning milk being 3·91 per cent. and in the evening 3·53 per cent.

CLASS XVIII.—*British Holstein Cows*.—Six cows competed, but none came up to the standard of 110, the average being only 80·7. Other comments on this class are given earlier in the Report.

*Milk Deficient in Fat or other Solids.*—Quite an appreciable number—22 out of 105 animals tested—yielded milk below the 3 per cent. standard of fat, as will be seen from the detailed results published on Table V, in which they are summarised. That cows which have been yielding good milk under normal home conditions frequently produce milk at shows which is deficient in fat is common experience. When this is so, it can only be assumed that the abnormal surroundings and conditions at a show so prejudicially affect the animal as to act, through the nervous system, in creating abnormalities in the composition of milk. Only two animals yielded milk below the standard of 8.5 per cent. of solids not fat.

*Goats.*—There was a considerable falling off in the entries as compared with 1913.

Fourteen competed, obtaining an average of 12.24; in 1913 the average was 13.8. The winner, Mr. M. E. Mitchell's "Hawthorn Granite," obtained 17.18 points, with a daily milk yield averaging 5.7 lbs., or over half-a-gallon, containing 4.78 per cent. fat in the morning milk and 4.96 per cent. in the evening.

This Anglo-Nubian Toggenburg obtained the "Baroness Burdett-Coutts" Challenge Cup, which is awarded to the goat winning the highest number of points in the Milking Trials and by Inspection.

Particulars of the performance of each goat tested are given after those of the cows.

The trials are carried out practically on the same lines as with the cows, but the calculation of points is on the following scale:—

	No. of Points.
For each pound of milk . . . . .	1
For each 60 days the goat has been in milk, with a maximum of six points . . . . .	1
For each $\frac{1}{4}$ lb. of fat in the milk . . . . .	5
For each $\frac{1}{4}$ lb. of solids other than fat in the milk . . . . .	1

In cases where the milk contains less than 4 per cent. of fat, one point is deducted.

No prize is awarded to a goat giving less than 2 lbs. of milk per day.

TABLE I.—SHOWING THE NUMBER OF COWS COMING UP TO THE STANDARD.

Cows	Standard	Cows Tested	Above Standard	Average Points Gained	Average Points of Cows above Standard
Shorthorns, Pedigree .. ..	100	14	10	106.5	115.1
Shorthorn Pedigree Heifers .. ..	66	15	7	62.4	74.1
Shorthorns, Non-Pedigree .. ..	110	15	8	106.9	142.5
Shorthorn Non-Pedigree Heifers.. ..	73	10	6	73.6	83.7
Lincolnshire Reds .. ..	100	5	2	96.3	104.1
Lincolnshire Red Heifers.. ..	66	4	2	67.7	71.8
Jersey Cows .. ..	95	12	4	89.8	107.1
Guernsey Cows .. ..	85	6	2	85.5	94.5
Red Poll Cows .. ..	90	5	5	127.7	127.7
Red Poll Heifers .. ..	60	7	5	65.5	70.1
Ayrshires .. ..	90	None	—	—	—
South Devons .. ..	100	6	4	108.5	118.0
Kerries .. ..	80	None	—	—	—
British Holsteins .. ..	110	6	—	80.7	{ None above Standard.
Total .. ..	—	105	55		



TABLE II.—AVERAGE POINTS GAINED IN THE MILKING TRIALS FOR THE PAST 15 YEARS.

Year	Shorthorn Pedigree	Shorthorn Pedigree Heifers	Shorthorn Non-Pedigree	Shorthorn Non-Pedigree Heifers	Lincolnshire Red Shorthorns	Lincolnshire Red Heifers	Jerseys	Guernseys	Red Poll Cows	Red Poll Heifers	Ayrshires	Dexters	Kerries	South Devons	British Holsteins
1914 ..	106.5	62.4	106.9	73.6	96.3	67.7	89.8	85.5	127.6	65.5	—	—	—	108.5	80.7
1913 ..	95.2	63.2	117.1	75.2	95.7	69.0	90.4	77.3	95.5	68.8	107.6	—	68.3	103.9	—
1912 ..	98.0	40.3	124.4	79.4	95.5	67.3	94.5	71.0	96.3	75.9	79.6	—	93.3	110.6	—
1911 ..	89.0	61.4	112.2	76.5	103.5	65.9	91.9	88.8	80.2	63.7	54.3	—	67.0	104.1	—
1910 ..	109.5	—	105.4	—	99.4	—	90.5	77.9	95.5	—	74.6	—	89.1	107.2	—
1909 ..	97.5	—	103.4	—	101.7	—	88.6	73.3	86.4	—	—	—	70.2	93.7	—
1908 ..	99.5	—	103.6	—	95.7	—	82.3	80.7	74.1	—	62.6	68.8	74.3	—	—
1907 ..	94.6	—	102.4	—	103.6	—	86.9	84.6	90.6	—	54.3	70.5	91.1	—	—
1906 ..	88.0	—	93.2	—	—	—	83.9	83.6	76.5	—	85.4	65.8	81.3	111.5	—
1905 ..	92.1	—	106.3	—	—	—	93.4	78.1	78.5	—	76.4	—	67.3	—	—
1904 ..	73.6	—	101.1	—	—	—	91.5	76.1	85.4	—	51.2	62.9	79.5	—	—
1903 ..	85.1	—	111.8	—	—	—	84.5	66.4	82.8	—	—	—	75.8	—	—
1902 ..	75.6	—	105.3	—	—	—	77.8	66.4	80.0	—	40.5	71.6	62.0	—	—
1901 ..	86.0	—	113.9	—	—	—	78.2	77.2	94.0	—	85.7	68.0	82.2	—	—
1900 ..	72.4	—	108.2	—	—	—	63.4	80.3	87.5	—	—	55.7	71.1	—	—

TABLE III.—SHOWING THE HIGHEST POINTS GAINED DURING THE PAST 7 YEARS.

Breeds.	1914.	1913.	1912.	1911.	1910.	1909.	1908.
Shorthorns, Pedigree ... ..	144.8	127.6	125.6	153.3	136.7	123.9	130.2
Shorthorns, Pedigree Heifers ...	98.1	83.6	57.7	76.7	85.7	88.4	74.0
Shorthorns, Non-Pedigree ... ..	136.9	158.0	169.5	143.0	138.5	142.7	133.0
Shorthorns, Non-Pedigree Heifers ...	97.6	102.1	106.7	108.8	85.1	89.0	88.7
Lincolnshire Reds, Shorthorns ...	105.5	114.8	130.4	133.5	124.2	144.4	115.9
Lincolnshire Reds, Heifers ... ..	77.2	81.2	89.1	81.1	66.2	—	—
Jerseys ... ..	112.2	123.1	117.9	115.4	111.6	129.2	100.7
Guernseys ... ..	99.7	93.8	85.0	88.8	82.5	84.7	94.1
Red Polls ... ..	144.9	120.5	122.7	120.3	120.0	108.8	93.6
Red Poll Heifers ... ..	98.1	81.2	90.8	70.9	79.6	74.5	72.4
Ayrshires ... ..	—	130.2	90.9	75.7	87.7	—	82.1
Kerries ... ..	—	93.7	102.8	92.9	100.3	77.4	104.3
South Devons ... ..	133.8	115.7	144.8	112.7	135.6	120.9	—
British Holsteins... ..	103.6	—	—	—	—	—	—

TABLE IV.—QUANTITY AND QUALITY OF MILK, 1908-1914.

Breed	Year	No. of Animals	Average Weight of Milk		Total Weight of Milk	Percentage Composition of Milk						Total Solids
			Milk			Fat		Solids, not Fat				
			Morn.	Even.		Morn.	Even.	Morn.	Even.	Morn.	Even.	
Shorthorns, Pedigree	1908	15	24.2	24.0	48.2	3.26	3.88	9.18	8.84	12.44	12.72	
	1909	19	23.2	22.1	45.3	3.43	4.27	8.98	8.80	12.41	13.07	
	1910	11	26.0	24.0	50.0	3.77	4.25	9.08	9.03	12.85	13.28	
	1911	13	23.8	21.5	45.3	3.23	3.75	9.21	8.95	12.44	12.70	
	1912	13	24.5	21.8	46.3	3.66	4.01	9.16	9.13	12.82	12.14	
Shorthorns, Pedigree (Heifers)	1913	24	24.9	22.9	47.8	3.39	3.67	9.06	8.94	12.45	12.61	
	1914	14	26.4	23.8	50.2	3.60	4.09	9.18	9.08	12.78	13.17	
	1908	9	16.1	16.6	32.7	2.70	3.36	9.20	8.95	11.90	12.31	
	1909	13	14.3	13.4	27.7	3.49	3.74	9.24	9.06	12.73	12.80	
	1910	12	16.6	15.2	31.8	3.22	3.74	9.42	9.29	12.64	13.03	
Shorthorns, Non-Pedigree Cows	1911	10	16.8	14.9	31.7	3.24	3.41	9.21	9.21	12.45	12.61	
	1912	3	12.9	11.3	24.2	3.47	3.13	9.44	9.34	12.81	12.47	
	1913	20	14.9	13.9	28.8	3.71	4.16	9.26	9.05	12.97	13.21	
	1914	15	15.8	14.1	29.9	3.26	3.89	9.19	9.08	12.45	12.97	
	1908	19	26.3	24.9	51.2	3.66	4.00	9.04	8.73	12.70	12.73	
Shorthorns, Non-Pedigree (Heifers)	1909	13	27.2	25.6	52.8	3.54	4.37	8.99	8.77	12.53	13.14	
	1910	16	27.0	24.7	51.7	3.60	4.08	8.97	8.94	12.57	13.02	
	1911	18	29.0	26.2	55.2	3.43	4.36	9.26	8.95	12.69	13.37	
	1912	22	31.4	28.3	59.7	3.69	4.29	9.11	8.94	12.80	13.23	
	1913	10	29.8	28.6	58.4	3.72	3.92	8.97	8.77	12.69	12.69	
Shorthorns, Non-Pedigree (Heifers)	1914	15	27.9	25.1	53.0	3.62	4.10	8.97	8.86	12.49	12.96	
	1908	4	17.8	16.9	34.7	3.80	3.74	9.29	9.12	13.09	12.86	
	1909	10	18.7	17.6	36.3	3.04	3.69	9.26	9.03	12.30	12.72	
	1910	11	16.6	16.0	32.6	3.31	3.72	9.33	9.24	12.64	12.96	
	1911	7	19.3	17.7	37.0	3.51	3.72	9.51	9.25	13.03	12.99	
Shorthorns, Non-Pedigree (Heifers)	1912	2	19.7	18.6	38.3	3.57	4.31	9.41	9.39	12.98	13.70	
	1913	11	19.0	17.4	36.4	3.76	4.16	8.99	8.87	12.75	13.03	
	1914	10	19.0	16.7	35.7	3.41	3.66	9.28	9.17	12.69	12.83	

TABLE IV.—QUANTITY AND QUALITY OF MILK, 1908-1914—Continued.

Breed	Year	No. of Animals	Average Weight of Milk		Total Weight of Milk	Percentage Composition of Milk				Total Solids	
			Morn.	Even.		Fat		Solids, not Fat		Morn.	Even.
						Morn.	Even.	Morn.	Even.		
Lincolnshire Red Shorthorns	1908	9	24.8	23.9	48.7	3.24	3.93	8.84	8.70	12.08	12.63
	1909	7	25.0	23.5	48.5	3.14	4.59	9.06	8.90	12.20	13.49
	1910	8	24.1	21.5	45.6	3.60	4.00	9.03	8.96	12.63	12.96
	1911	7	26.4	23.7	50.1	3.19	4.66	9.05	8.85	12.24	13.51
	1912	8	24.0	22.2	46.2	3.41	3.96	9.24	9.02	12.65	12.98
Lincolnshire Red Heifers	1913	7	26.2	21.4	47.6	3.58	3.48	8.73	8.74	12.31	12.22
	1914	5	26.2	22.6	48.8	3.22	3.48	8.99	9.15	12.21	12.63
	1911	6	16.8	15.5	32.3	3.28	3.70	9.32	9.33	12.60	13.03
	1912	6	16.6	15.6	32.2	3.67	3.75	9.18	9.03	12.85	12.78
	1913	5	18.5	16.8	35.3	3.51	3.74	9.09	9.00	12.60	12.74
Jerseys	1914	4	18.5	16.3	34.8	3.14	3.69	9.28	9.16	12.42	12.85
	1908	16	17.4	16.8	34.2	4.07	4.91	9.32	8.99	13.39	13.90
	1909	23	17.7	16.6	34.3	4.85	5.76	9.44	9.09	14.29	14.85
	1910	19	18.6	15.9	34.5	5.15	5.66	9.17	9.08	14.32	14.74
	1911	16	19.6	17.3	36.9	4.65	5.31	9.24	9.06	13.89	14.37
Guernseys	1912	9	20.2	17.3	37.5	4.40	5.39	9.17	9.03	13.57	14.42
	1913	12	18.4	16.6	35.0	4.53	5.34	9.21	9.01	13.74	14.35
	1914	12	18.4	16.7	35.1	4.67	5.15	9.40	9.15	14.07	14.30
	1908	5	17.5	16.1	33.6	4.49	4.88	9.08	8.76	13.57	13.64
	1909	6	16.0	13.3	29.3	4.81	5.08	9.40	9.11	14.21	14.19
Red Poll Cows	1910	3	17.4	14.6	32.0	4.11	4.94	9.26	9.12	13.37	14.06
	1911	1	18.7	15.3	34.0	4.16	4.70	9.32	9.46	13.48	14.16
	1912	4	15.9	14.1	30.0	4.47	5.24	9.02	8.91	13.49	14.15
	1913	10	16.1	13.6	29.7	4.72	5.35	9.30	9.17	14.02	14.52
	1914	6	19.2	15.7	34.9	4.52	5.04	9.54	9.46	14.06	14.50
	1908	9	18.6	17.9	36.5	3.44	3.56	9.20	8.98	12.64	12.54
	1909	8	21.0	19.6	40.6	3.36	3.85	9.17	9.06	12.53	12.91
	1910	7	22.3	19.1	41.4	3.75	4.14	9.21	9.14	12.96	13.28
	1911	6	19.9	17.9	37.8	3.29	4.15	9.20	9.08	12.49	13.23
	1912	8	24.9	21.2	46.1	3.50	3.65	9.13	9.09	12.63	12.74
	1913	6	26.4	23.0	49.4	3.14	3.58	8.96	8.69	12.10	12.27
	1914	5	31.7	26.8	58.5	3.99	3.73	9.13	9.31	13.12	13.04



TABLE V.—NUMBER OF ANIMALS YIELDING MILK DEFICIENT IN FAT OR OTHER SOLIDS.

	Less than 3 per cent. of Fat								Less than 8·5 per cent. of other Solids							
	1914	1913	1912	1911	1910	1909	1908	1907	1914	1913	1912	1911	1910	1909	1908	1907
<b>Cows.</b>																
Shorthorns, Pedigree ..	2	6	3	5	1	2	4	8	0	3	0	1	0	1	2	2
Shorthorns, Non-Pedigree	4	3	5	6	2	3	4	8	2	3	2	3	1	4	4	0
Shorthorns, Lincoln Reds	2	0	2	4	1	3	4	3	0	1	0	0	0	0	1	0
Jerseys ..	0	0	0	1	0	1	1	0	0	0	0	1	2	0	0	0
Guernseys ..	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
Red Polls ..	0	2	3	2	0	2	2	1	0	1	0	0	0	0	1	0
Kerries ..	No Entries	0	0	0	0	0	0	0	No Entries	0	0	1	0	0	1	0
South Devons	2	0	0	1	2	0	0	0	0	0	0	0	1	0	0	0
Ayrshires ..	No Entries	0	2	1	0	0	0	0	No Entries	0	1	1	0	0	0	0
British Holsteins	4	—	—	—	—	—	—	—	0	—	—	—	—	—	—	—
<b>HEIFERS.</b>																
Shorthorns, Pedigree ..	3	1	2	4	4	4	6	2	0	0	0	0	0	2	1	1
Shorthorns, Non-Pedigree	2	1	1	2	5	4	0	3	0	2	0	0	0	0	0	0
Shorthorns, Lincoln Reds	2	2	1	1	3	0	0	0	0	1	0	0	0	0	0	0
Red Polls ..	1	0	0	1	1	0	1	2	0	0	0	0	0	0	0	1
<b>Total ..</b>	<b>22</b>	<b>15</b>	<b>19</b>	<b>28</b>	<b>19</b>	<b>19</b>	<b>22</b>	<b>27</b>	<b>2</b>	<b>11</b>	<b>3</b>	<b>7</b>	<b>4</b>	<b>7</b>	<b>11</b>	<b>4</b>







CLASS 1.—SHORTHORN COWS—Continued.

Number ...	...	...	...	11 Helen.	13 Daisy Bella 9th.	14 Rose 44th.	15 Melody 13th.
Name ..	...	...	...	Nov. 1, 1907.	Mar. 2, 1907.	Nov. 17, 1907.	Mar. 11, 1909.
Born ...	...	...	...	Oct. 5. 16	Oct. 1. 20	Sept. 13. 38	Sept. 1. 50
Number of Calves	...	...	...	...	...	...	...
Last Calved ...	...	...	...	...	...	...	...
Days since Calving	...	...	...	...	...	...	...
Weight of Milk, 1st day	...	...	...	Morn Even	Morn Even	Morn Even	Morn Even
Weight of Milk, 2nd day	...	...	...	22.9 21.2	29.6 25.7	40.3 32.7	27.9 25.2
Total ...	...	...	...	22.2 20.4	31.0 26.8	40.1 32.8	30.2 24.8
Average ...	...	...	...	45.1 41.6	60.6 52.5	80.4 65.5	58.1 50.0
...	...	...	...	22.5 20.8	30.3 26.2	40.2 32.7	29.0 25.0
Percentage { Fat ...	...	...	...	4.45 5.21	5.17 5.39	3.0 3.42	2.49 3.26
Composition of { Solids other than Fat	...	...	...	9.71 9.53	9.19 9.23	8.52 8.84	9.09 9.24
the Milk. { Solids ...	...	...	...	14.16 14.74	14.36 14.62	11.52 12.26	11.58 12.50
Actual weight of Fat, in lbs. ...	...	...	...	1.0 1.08	1.57 1.40	1.21 1.12	.725 .82
Calculation of Points multiply by 20	...	...	...	29.0 21.6	31.4 28.0	2.42 2.24	14.50 16.4
Actual weight of Solids other than Fat, in lbs.	...	...	...	2.18 2.0	2.78 2.42	3.42 2.90	2.64 2.30
Calculation of Points multiply by 4 ...	...	...	...	8.72 8.0	11.12 9.68	13.68 11.60	10.56 9.20
Points { For time since Calving	...	...	...	...	...	...	1.0
{ For weight of Milk ...	...	...	...	43.3	56.5	72.9	54.0
{ For weight of Fat ...	...	...	...	41.6	59.4	46.6	30.9
{ For weight of Solids other than Fat	...	...	...	16.7	20.8	25.3	19.8
Total ...	...	...	...	101.6	136.7	144.8	105.7
Deductions ...	...	...	...	...	...	...	10.0
Points gained	...	...	...	101.6	136.7	144.8	95.7
Remarks and Awards ...	...	...	...	High Commendation.	2nd Prize.	1st Prize. Shorthorn Society Prize. Res. Batham Chalk Cup. Win. Spencer Chalk Cup. Win. Shirley Chalk Cup.	

CLASS 1.—SHORTHORN COWS—Continued.

Number ...	...	...	...	...	...	16	18
Name ...	...	...	...	...	...	Red Rose 4th.	Primrose 3rd.
Born ...	...	...	...	...	...	Mar. 10, 1904.	Sept. 5, 1903.
Number of Calves ...	...	...	...	...	...	—	8
Last Calved ...	...	...	...	...	...	Oct. 5,	Oct. 1.
Days since Calving ...	...	...	...	...	...	16	20
Weight of Milk, 1st day	...	...	...	...	...	Morn Even	Morn Even
Weight of Milk, 2nd day	...	...	...	...	...	30.0 25.3	33.0 27.1
Total	...	...	...	...	...	29.0 24.9	36.4 30.8
Average ...	...	...	...	...	...	59.0 50.2	69.4 57.9
Percentage { Fat ...	...	...	...	...	...	29.5 25.1	34.7 28.9
Composition of { Solids other than Fat	...	...	...	...	...	3.62 4.61	3.22 3.15
the Milk. { Solids ...	...	...	...	...	...	8.78 8.61	9.18 9.35
Actual weight of Fat, in lbs. ...	...	...	...	...	...	12.40 13.22	12.40 12.50
Calculation of Points multiply by 20...	...	...	...	...	...	1.07 1.31	1.12 .91
Actual weight of Solids other than Fat, in lbs.	...	...	...	...	...	21.4 26.2	22.4 18.2
Calculation of Points multiply by 4 ...	...	...	...	...	...	2.60 2.16	3.18 2.70
{ For timing since Calving ...	...	...	...	...	...	10.40 8.64	12.72 10.80
{ For weight of Milk ...	...	...	...	...	...	—	—
{ For weight of Fat ...	...	...	...	...	...	54.6	63.6
{ For weight of Solids other than Fat	...	...	...	...	...	47.6	40.6
Total ...	...	...	...	...	...	19.0	23.5
Deductions ...	...	...	...	...	...	121.2	127.7
Points gained ...	...	...	...	...	...	—	—
Remarks and Awards ...	...	...	...	...	...	121.2	127.7
	...	...	...	...	...	Reserve.	3rd Prize.

CLASS 2.—SHORTHORN HEIFERS (NOT EXCEEDING THREE YEARS OLD).

Number ...	...	...	...	20	21	27	28
Name ...	...	...	...	Welcome.	Prospect.	Barrington Welcome 2nd.	Barrington Cranford 18th.
Born ...	...	...	...	Dec. 8th, 1911.	Jan. 24, 1912.	May 7th, 1912.	Dec. 9th, 1911.
Number of Calves ...	...	...	...	Sept. 4.	Sept. 23.	Sept. 28.	Aug. 15.
Last Calved ...	...	...	...	47	28	23	67
Days since Calving ...	...	...	...				
Weight of Milk, 1st day	...	...	...	Morn Even	Morn Even	Morn Even	Morn Even
Weight of Milk, 2nd day	...	...	...	11.1 10.6	19.9 16.0	19.9 18.0	13.2 12.0
Total ...	...	...	...	12.7 11.9	18.5 18.3	21.7 16.2	14.6 12.1
Average ...	...	...	...	23.8 22.5	38.4 34.3	41.6 34.2	27.8 24.1
Percentage (Fat ...	...	...	...	11.9 11.2	19.2 17.1	20.8 17.1	13.9 12.0
Composition of { Solids other than Fat	...	...	...	3.44 4.54	2.51 3.18	3.03 4.76	3.04 3.21
the Milk. { Solids	...	...	...	9.50 9.10	8.79 8.72	9.27 9.04	9.40 9.39
Actual weight of Fat, in lbs. ...	...	...	...	12.94 13.64	11.30 11.90	12.30 13.80	12.44 12.60
Calculation of Points multiply by 20	...	...	...	.41 .51	.48 .54	.63 .81	.42 .38
Actual weight of Solids other than Fat, in lbs.	...	...	...	8.2 10.2	9.6 10.8	12.6 16.2	8.4 7.6
Calculation of Points multiply by 4	...	...	...	1.13 1.02	1.7 1.49	1.92 1.60	1.31 1.13
Points { For time since Calving	...	...	...	4.52 4.08	6.8 5.96	7.08 6.40	5.24 4.52
For weight of Milk ...	...	...	...	.7			2.7
For weight of Fat ...	...	...	...	23.1	36.3	37.9	25.9
For weight of Solids other than Fat	...	...	...	18.4	20.4	28.8	16.0
Total ...	...	...	...	8.6	12.8	14.1	9.8
Deductions ...	...	...	...	50.8	69.5	80.8	54.4
Points gained	...	...	...	10.0	10.0		
Remarks and Awards ...	...	...	...	50.8	59.5	80.8	54.4
	...	...	...			2nd Prize.	

CLASS 2.—SHORTHORN HEIFERS (NOT EXCEEDING THREE YEARS OLD)—Continued.

Number	Name	...	...	...	...	29		30		31		32	
						Juno.		Gladys Rose 12th.		Dolphinlee Primrose.		Lady Nottingham 21st.	
Born	...	...	...	...	...	Nov. 12, 1911.		Feb. 27, 1912.		Sept. 10, 1911.		Feb. 28, 1912.	
Last Calved	...	...	...	...	...	July 21.		Sept. 8		Jan. 21.		Sept. 28.	
Days since Calving	...	...	...	...	...	92		43		273		23	
Weight of Milk, 1st day	...	...	...	...	...	Morn		Morn		Morn		Morn	
						Even		Even		Even		Even	
Weight of Milk, 2nd day	...	...	...	...	...	14.1	12.2	14.6	12.3	13.9	12.4	17.1	15.3
						13.8	12.6	13.5	12.6	13.4	11.7	18.5	15.0
Total	...	...	...	...	...	27.9	24.8	28.1	24.9	27.3	24.1	35.6	30.3
Average	...	...	...	...	...	13.9	12.4	14.0	12.4	13.6	12.0	17.8	15.1
Percentage of Fat	...	...	...	...	...	3.11	3.37	2.58	3.32	3.30	4.48	3.51	3.71
						8.81	8.73	8.90	9.00	9.48	9.26	9.09	9.19
Composition of Solids other than Fat	...	...	...	...	...	11.92	12.10	11.48	12.32	12.78	13.74	12.60	12.90
						.43	.42	.36	.41	.45	.54	.62	.56
Actual weight of Fat, in lbs.	...	...	...	...	...	8.6	8.4	7.2	8.2	9.0	10.8	12.4	11.2
Calculation of Points multiply by 20	...	...	...	...	...	1.22	1.08	1.24	1.12	1.28	1.12	1.61	1.39
Actual weight of Solids other than Fat, in lbs.	...	...	...	...	...	4.88	4.32	4.96	4.48	5.12	4.48	6.44	5.56
Calculation of Points multiply by 4	...	...	...	...	...	5.2		.3		12.0			
For time since Calving	...	...	...	...	...	26.3		26.4		25.6		32.9	
For weight of Milk	...	...	...	...	...	17.0		15.4		19.8		23.6	
For weight of Fat	...	...	...	...	...	9.2		9.4		9.6		12.0	
For weight of Solids other than Fat	...	...	...	...	...								
Total	...	...	...	...	...	57.7		51.5		67.0		68.5	
Deductions	...	...	...	...	...			10.0					
Points gained	...	...	...	...	...	57.7		41.5		67.0		68.5	
Remarks and Awards	...	...	...	...	...					High Commendation.		Reserve.	

CLASS 2.—SHORTHORN HEIFERS (NOT EXCEEDING THREE YEARS OLD)—Continued.

Number ...	...	34	35	37	38
Name ...	...	Chevron Moserose 4th	Lady York.	Daisy May.	Roan Sister 2nd.
Born ...	...	Dec. 6, 1911.	June 22, 1912	April 19, 1912.	Dec. 3, 1911.
Number of Calves ...	...	1	—	—	2
Last Calved ...	...	June 21.	Sept. 14.	Oct. 3.	July 16.
Days since Calving ...	...	122	37	18	97
Weight of Milk, 1st day	...	Morn Even	Morn Even	Morn Even	Morn Even
Weight of Milk, 2nd day	...	12.8 13.7	15.0 13.9	12.5 11.1	17.4 16.4
Total	...	14.3 13.2	14.3 14.0	12.7 11.8	17.0 16.2
Average	...	27.1 26.9	29.3 27.9	25.2 22.9	34.4 32.6
Percentage { Fat ...	...	13.5 13.4	14.6 13.9	12.6 11.4	17.2 16.3
Composition of { Solids other than Fat	...	3.68 4.91	3.0 3.09	4.04 3.78	3.43 3.35
the Milk. { Solids ...	...	9.48 9.23	9.30 9.31	9.70 9.42	8.77 8.71
Actual weight of Fat, in lbs. ...	...	13.16 14.20	12.30 12.40	13.74 13.20	12.20 12.06
Calculation of Points multiply by 20	...	.50 .66	.44 .43	.51 .43	.41 .55
Actual weight of Solids other than Fat, in lbs.	...	10.0 13.2	8.8 8.6	10.2 8.6	8.2 11.0
Calculation of Points multiply by 4 ...	...	1.27 1.24	1.36 1.29	1.22 1.07	1.50 1.42
Points { For time since Calving ...	...	5.08 4.96	5.44 5.16	4.88 4.28	6.0 5.68
{ For weight of Milk ...	...	8.2	28.5	24.0	5.7
{ For weight of Fat ...	...	26.9	17.4	18.8	33.5
{ For weight of Solids other than Fat ...	...	23.2	10.6	9.2	19.2
Total	...	10.0	56.5	52.0	11.7
Deductions	...	68.3	—	—	70.1
Points gained	...	—	56.5	52.0	—
Remarks and Awards ...	...	High Commendation.	—	—	3rd Prize.

CLASS 2.—SHORTHORN HEIFERS (NOT EXCEEDING THREE YEARS OLD)—Continued.

40						41		42	
Kalmescott Carmine Lady						Sybil 18.		Orange 44.	
Sept. 1, 1911.						Nov. 26, 1911.		Feb. 21, 1912.	
Sept. 1.						Sept. 23.		Sept. 26.	
50						28		25	
Morn Even						Morn Even		Morn Even	
13-9 14-5						23-4 20-4		16-4 13-7	
15-4 11-4						24-4 21-7		16-4 14-2	
29-3 25-9						47-8 42-1		32-8 27-9	
14-6 12-9						23-9 21-0		16-4 13-9	
2-48 4-0						3-73 4-65		4-04 4-02	
9-16 8-84						8-61 8-71		9-60 9-62	
11-64 12-84						12-34 13-36		13-64 13-64	
36 51						90 98		66 56	
7-2 10-2						18-0 19-6		13-2 11-2	
1-33 1-14						2-08 1-83		1-38 1-33	
5-32 4-56						8-32 7-32		6-32 5-32	
1-0						—		—	
27-5						44-9		30-3	
17-4						37-6		24-4	
9-9						15-6		11-6	
Total						98-1		66-3	
Deductions						—		—	
Points gained						98-1		66-3	
1st Prize.						High Commendation.			

CLASS 3.—SHORTHORN COWS (NOT ELIGIBLE FOR CLASS 1).

Number	Name	Born	Number of Calves Last Calved	Days since Calving	43 Lady Crage Vale. 4 yrs. 7 mos. Oct. 2. 19	44 Sylvia. 8 yrs. Oct. 2. 19	48 Pertha. Unknown. Oct. 1. 20	50 Model Maid 2nd. May 20, 1910. July 21. 92
Weight of Milk, 1st day	...	...	...	...	Morn Even	Morn Even	Morn Even	
Weight of Milk, 2nd day	...	...	...	...	26.0 27.0	28.1 25.1	24.4 24.0	
Total	...	...	...	...	30.0 25.1	26.5 24.9	24.6 22.7	
Average	...	...	...	...	56.0 52.1	54.6 50.0	49.0 46.7	
Percentage { Fat	...	...	...	...	28.0 26.0	27.3 25.0	24.5 23.3	
Composition of { Solids other than Fat	...	...	...	...	3.71 4.91	3.86 4.67	2.05 2.69	
the Milk. { Solids	...	...	...	...	9.03 8.79	9.36 9.67	8.85 8.83	
Actual weight of Fat, in lbs.	...	...	...	...	12.74 13.70	13.22 13.74	10.90 11.52	
Calculation of Points multiply by 20	...	...	...	...	1.04 1.27	1.05 1.20	.49 .63	
Actual weight of Solids other than Fat, in lbs.	...	...	...	...	20.8 25.4	21.0 24.0	9.8 12.6	
Calculation of Points multiply by 4	...	...	...	...	2.52 2.28	2.55 2.26	2.18 2.04	
Points { For time since Calving	...	...	...	...	10.08 9.12	10.20 9.04	8.72 8.16	
{ For weight of Milk	...	...	...	...	...	...	...	5.2
{ For weight of Fat	...	...	...	...	54.0	52.3	47.8	
{ For weight of Solids other than Fat	...	...	...	...	46.2	45.0	22.4	
Total	...	...	...	...	19.2	19.2	16.9	
Deductions	...	...	...	...	119.4	116.5	92.3	
Points gained	...	...	...	...	10.0	...	20.0	
Remarks and Awards	...	...	...	...	124.5	116.5	72.3	
	...	...	...	...	High Commendation.	High Commendation.		

CLASS 3.—SHORTHORN COWS (NOT ELIGIBLE FOR CLASS 1)—Continued.

Number ...	...	...	51 Primrose.	53 Queenie.	54 Daisy.	55 Ruby.
Name ...	...	...	...	...	...	...
Born ...	...	...	Oct 17, 1909.	About 1908.	Mar. 4, 1909.	Unknown.
Number of Calves	...	...	3	4	...	...
Last Calved ...	...	...	Aug. 1.	Sept. 3.	Oct. 1.	Sept. 19.
Days since Calving	...	...	81	48	20	32
Weight of Milk, 1st day	...	...	Morn Even	Morn Even	Morn Even	Morn Even
Weight of Milk, 2nd day	...	...	18-9 17-4	28-9 25-6	22-0 20-8	31-3 28-8
Total	...	...	22-2 21-0	27-5 27-8	21-7 18-4	28-7 32-2
Average ...	...	...	41-1 38-4	56-4 53-4	43-7 39-2	60-0 61-0
Percentage (Fat ...	...	...	20-5 19-2	28-2 26-7	21-8 19-6	30-0 30-5
Composition of { Solids other than Fat	...	...	2-95 2-37	2-71 3-55	3-35 4-09	3-39 4-14
the Milk. { Solids	...	...	8-95 8-89	8-55 8-51	8-43 8-55	8-69 8-52
Actual weight of Fat, in lbs. ...	...	...	11-90 11-26	11-26 12-36	11-78 12-64	12-08 12-66
Calculation of Points multiply by 20	...	...	60 .45	76 1-02	73 .80	1-02 1-26
Actual weight of Solids other than Fat, in lbs.	...	...	12-0 9-0	15-2 20-4	14-6 16-0	20-4 25-2
Calculation of Points multiply by 4	...	...	1-84 1-70	1-56 2-28	1-84 1-68	2-6 2-6
Points { For time since Calving	...	...	4-1	8	...	...
{ For weight of Milk ...	...	...	39-7	54-9	41-4	60-5
{ For weight of Fat ...	...	...	21-0	35-6	30-6	45-6
{ For weight of Solids other than Fat	...	...	14-2	13-4	14-1	20-8
Total ...	...	...	79-0	106-7	86-1	126-9
Deductions ...	...	...	20-0	10-0	10-0	...
Points gained	...	...	59-0	96-7	76-1	126-9
Remarks and Awards ...	...	...	...	...	...	3rd Prize.



CLASS 3.—SHORTHORN COWS (NOT ELIGIBLE FOR CLASS 1).—Continued.

Number Name	...	...	...	...	56 Liberty.	57 Beauty.	59 Southfield Edna.	61 Snowball
Born	...	...	...	...	6 yrs.	5 yrs.	Unknown.	Jan. 19, 1908.
Number of Calves	...	...	...	...	...	...	...	...
Last Calved	...	...	...	...	Sept. 20, 31	Sept. 27, 24	Sept. 20, 31	Oct. 1, 20
Days since Calving	...	...	...	...	...	...	...	...
Weight of Milk, 1st day	...	...	...	...	Morn	Even	Morn	Even
Weight of Milk, 2nd day	...	...	...	...	30-7	28-1	35-7	30-4
Total	...	...	...	...	28-2	26-8	30-0	25-8
Average	...	...	...	...	58-0	54-9	63-7	56-2
Percentage	...	...	...	...	29-4	27-4	32-8	28-1
Composition of	...	...	...	...	4-84	5-72	3-44	3-97
the Milk.	...	...	...	...	9-12	8-76	9-00	8-53
Actual weight of Fat, in lbs.	...	...	...	...	13-96	14-48	12-44	12-50
Calculation of Points multiply by 20	...	...	...	...	1-42	1-57	1-13	1-12
Actual weight of Solids other than Fat, in lbs.	...	...	...	...	28-4	31-4	22-6	22-4
Calculation of Points multiply by 4	...	...	...	...	2-08	2-40	2-95	2-40
Points	...	...	...	...	10-72	9-60	11-80	9-60
For time since Calving	...	...	...	...	...	...	...	...
For weight of Milk	...	...	...	...	53-4	...	60-9	...
For weight of Fat	...	...	...	...	46-8	...	45-0	...
For weight of Solids other than Fat	...	...	...	...	19-4	...	21-4	...
Total	...	...	...	...	119-6	...	127-3	...
Deductions	...	...	...	...	...	...	...	...
Points gained	...	...	...	...	119-6	...	127-3	...
Remarks and Awards	...	...	...	...	High Commendation.	2nd Prize. Reserve for Special Challenge Cup.	...	...
1st Prize.	...	...	...	...	...	...	...	...
2nd Prize.	...	...	...	...	...	...	...	...

CLASS 3.—SHORTHORN COWS (NOT ELIGIBLE FOR CLASS 1).—Continued.

Number ...	...	...	...	...	65 Silvertown Dahlia.	66 Sherwood Rose 2nd.	68 Ruby.
Name ...	...	...	...	...	...	...	...
Born ...	...	...	...	...	7 years.	...	About 5 yrs.
Number of Calves ...	...	...	...	...	Oct. 1. 20	Oct. 5. 16	Sept. 30. 21
Last Calved ...	...	...	...	...	...	...	...
Days since Calving ...	...	...	...	...	...	...	...
<hr/>							
Weight of Milk, 1st day	...	...	...	...	Morn	Even	Morn
Weight of Milk, 2nd day	...	...	...	...	36.5	30.4	24.0
Total	...	...	...	...	31.8	28.4	24.3
Average ...	...	...	...	...	68.3	58.8	48.3
<hr/>							
Percentage { Fat ...	...	...	...	...	34.1	29.4	24.1
Composition of { Solids other than Fat	...	...	...	...	3.23	3.34	5.37
the Milk. { Solids	...	...	...	...	8.31	8.40	9.27
Actual weight of Fat, in lbs. ...	...	...	...	...	11.54	11.74	14.64
Calculation of Points multiply by 20	...	...	...	...	1.10	.98	1.30
<hr/>							
Actual weight of Solids other than Fat, in lbs.	...	...	...	...	22.0	19.6	28.0
Calculation of Points multiply by 4 ...	...	...	...	...	2.82	2.48	7.23
<hr/>							
Points { For time since Calving	...	...	...	...	11.28	9.92	8.9
{ For weight of Milk ...	...	...	...	...	63.5	58.3	44.9
{ For weight of Fat ...	...	...	...	...	41.6	45.0	45.2
{ For weight of Solids other than Fat	...	...	...	...	21.2	23.3	16.5
Total ...	...	...	...	...	126.3	126.6	106.6
Deductions ...	...	...	...	...	20.0	—	—
Points gained	...	...	...	...	106.3	126.6	106.6
<hr/>							
Remarks and Awards ...	...	...	...	...	Reserve.		

CLASS 4.—SHORTHORN HEIFERS (NOT EXCEEDING THREE YEARS).

Number ... Name ...	...	...	...	69 Rose.	70 Model Maid, 3rd.	71 Beauty.	75 Southfield Ruby.
Born ...	...	...	...	Sept. 14, 1911.	Dec. 3, 1911.	2 yrs. 9 mos.	Jan. 6, 1912.
Number of Calves ...	...	...	...	Oct. 3.	July 2.	Sept. 27.	Sept. 17.
Last Calved ...	...	...	...	18	111	24	34
Days since Calving ...	...	...	...				
Weight of Milk, 1st day ...	...	...	...	Morn Even	Morn Even	Morn Even	Morn Even
Weight of Milk, 2nd day ...	...	...	...	19.5 20.3	18.5 17.5	19.5 17.5	16.7 16.7
Total ...	...	...	...	21.2 20.0	19.7 18.4	19.9 16.7	16.3 16.1
Average ...	...	...	...	40.7 40.3	38.2 35.9	39.4 34.2	33.0 32.8
Percentage { Fat ...	...	...	...	20.3 20.1	19.1 17.9	19.7 17.1	16.5 16.4
Composition of { Solids other than Fat	...	...	...	2.92 4.15	3.10 3.37	3.71 3.54	3.54 3.46
the Milk. { Solids ...	...	...	...	9.52 9.35	9.18 9.21	9.33 8.84	9.20 8.82
Actual weight of Fat, in lbs. ...	...	...	...	12.44 13.50	12.28 12.58	13.04 12.38	12.74 12.28
Calculation of Points multiply by 20	...	...	...	.59 .84	.59 .60	.73 .61	.58 .42
Actual weight of Solids other than Fat, in lbs.	...	...	...	11.8 16.8	11.8 12.0	14.6 12.2	11.6 8.4
Calculation of Points multiply by 4	...	...	...	1.94 1.88	1.75 1.65	1.83 1.51	1.52 1.45
{ For time since Calving ...	...	...	...	7.76 7.52	7.0 6.6	7.3 6.0	6.10 5.80
Points { For weight of Milk ...	...	...	...	40.4	7.1	—	—
{ For weight of Fat ...	...	...	...	28.6	37.0	36.8	32.9
{ For weight of Solids other than Fat	...	...	...	15.3	23.8	26.8	20.0
Total ...	...	...	...	84.3	13.6	13.4	11.9
Deductions ...	...	...	...	10.	81.5	77.0	64.8
Points gained	...	...	...	74.3	81.5	77.0	64.8
Remarks and Awards ...	...	...	...	H.C.	2nd Prize	H.C.	—

CLASS 4.—SHORTHORN HEIFERS (NOT EXCEEDING THREE YEARS)—Continued.

Number ... Name ...	...	...	...	76 Southfield Vivian. Oct. 1, 1911. Sept. 20. 31	78 Silverton Daisy. April 12, 1912. June 25. 118	79 Lady Kersey. Dec. 5, 1911. June 1. 142	80 Bluebell 2nd. Dec. 13, 1911. Oct. 4. 17
Born ...	...	...	...	Morn Even	Morn Even	Morn Even	Morn Even
Number of Calves ...	...	...	...	22-9 23-4	18-0 14-0	22-0 18-6	16-4 16-0
Last Calved ...	...	...	...	23-9 20-5	19-1 17-6	17-6 15-0	15-6 15-2
Days since Calving ...	...	...	...	46-8 42-9	37-1 1-6	39-6 33-6	32-0 31-2
	...	...	...	23-4 21-4	18-5 15-8	19-8 16-8	16-0 15-6
Weight of Milk, 1st day ...	...	...	...	3-66 4-59	3-92 3-94	4-35 3-78	3-05 3-63
Weight of Milk, 2nd day ...	...	...	...	9-22 8-91	8-98 9-12	9-31 9-50	9-57 9-47
Total ...	...	...	...	12-88 13-50	12-90 13-06	13-66 13-28	12-62 13-10
Average ...	...	...	...	.85 .98	.72 .62	.86 0-63	.49 .55
Percentage of Fat ...	...	...	...	17-0 19-6	14-4 12-4	17-2 12-6	9-8 11-0
Composition of Fat ...	...	...	...	2-16 1-90	1-66 1-44	1-84 1-60	1-53 1-47
Solids other than Fat ...	...	...	...	8-6 7-6	6-6 5-8	7-4 6-4	6-1 5-9
Actual weight of Fat, in lbs. ...	...	...	...	...	7-8	10-2	...
Calculation of Points multiply by 20 ...	...	...	...	44-8	34-3	36-6	31-6
Actual weight of Solids other than Fat, in lbs. ...	...	...	...	36-6	26-8	29-8	20-8
Calculation of Points multiply by 4 ...	...	...	...	16-2	12-4	13-8	12-0
Points ...	...	...	...	97-6	81-3	90-4	64-4
For time since Calving ...	...	...	...	...	...	...	...
For weight of Milk ...	...	...	...	...	...	...	...
For weight of Fat ...	...	...	...	...	...	...	...
For weight of Solids other than Fat ...	...	...	...	...	...	...	...
Total ...	...	...	...	...	...	...	...
Deductions ...	...	...	...	...	...	...	...
Points gained ...	...	...	...	97-6	81-3	90-4	64-4
Remarks and Awards ...	...	...	...	1st Prize.	3rd Prize.	Disqualified.	...



CLASS 5.—LINCOLNSHIRE RED SHORTHORN COWS

Number ...	...	...	...	84	85	87	89
Name ...	...	...	...	Bendish Charm.	Bracebridge.	Burton Pride 18th.	Burton Spotted 10th.
Born ...	...	...	...	June, 1909.	March, 1905.	Sept. 24, 1910.	Sept. 13, 1909.
Number of Calves ...	...	...	...	Sept. 22.	July 18.	Sept. 1.	Sept. 1.
Last Calved ...	...	...	...	29	95	50	50
Days since Calving ...	...	...	...				
Weight of Milk, 1st day	...	...	...	Morn Even	Morn Even	Morn Even	Morn Even
Weight of Milk, 2nd day	...	...	...	30.6 27.1	23.4 19.5	25.4 23.5	23.2 23.4
Total ...	...	...	...	30.9 27.5	24.6 19.0	26.2 22.9	27.1 24.0
Average ...	...	...	...	61.5 54.6	48.0 38.5	51.6 46.4	55.3 47.4
Percentage { Fat ...	...	...	...	30.7 27.3	24.0 19.2	25.8 23.2	27.6 23.7
Composition of { Solids other than Fat	...	...	...	2.92 3.39	3.74 3.75	2.62 3.47	3.20 3.0
the Milk. { Solids	...	...	...	9.08 8.99	9.26 9.45	8.92 9.31	9.0 9.16
Actual weight of Fat, in lbs. ...	...	...	...	12.0 12.38	13.0 13.20	11.54 12.78	12.20 12.16
Calculation of Points multiply by 20	...	...	...	.90 .93	.90 .72	.67 .80	.88 .71
Actual weight of Solids other than Fat, in lbs.	...	...	...	18.0 18.6	18.0 14.4	13.4 16.0	17.6 14.2
Calculation of Points multiply by 4	...	...	...	2.78 2.45	2.22 1.81	2.28 2.16	2.48 2.17
Points { For time since Calving	...	...	...	11.1 9.8	8.88 7.24	9.12 8.64	9.9 8.7
{ For weight of Milk	...	...	...	58.0	5.5	1.0	1.0
{ For weight of Fat	...	...	...	36.6	43.2	49.0	51.3
{ For weight of Solids other than Fat	...	...	...	20.9	32.4	29.4	31.8
Total ...	...	...	...	115.5	16.1	17.8	18.6
Deductions ...	...	...	...	97.2	97.2	97.2	102.7
Points gained	...	...	...	10.0	10.0	10.0	102.7
Remarks and Awards ...	...	...	...	105.5	97.2	87.2	2nd Prize.
	...	...	...	1st Prize.			

CLASS 5.—LINCOLNSHIRE RED SHORTHORN COWS—Continued.

Number ...	...	...	...	90
Born ...	...	...	Burton Any 2nd	
Number of Calves	...	...	April 16, 1910.	
Last Calved ...	...	...	1	
Days since Calving	...	...	Sept. 27.	
			24	
Weight of Milk, 1st day	...	...	Morn	Even
Weight of Milk, 2nd day	...	...	24.3	20.7
Total	...	...	21.5	18.5
Average	...	...	45.8	39.2
			22.9	19.6
Percentage (Fat ...	...	...	3.61	3.79
Composition of Solids other than Fat	...	...	8.69	8.87
the Milk. (Solids	...	...	12.30	12.66
Actual weight of Fat, in lbs.	...	...	.83	.74
Calculation of Points multiply by 20	...	...	16.6	14.8
Actual weight of Solids other than Fat, in lbs.	...	...	2.00	1.74
Calculation of Points multiply by 4	...	...	8.0	7.0
Points { For time since Calving	...	...	—	—
For weight of Milk	...	...	42.5	
For weight of Fat	...	...	31.4	
For weight of Solids other than Fat	...	...	15.0	
Total	...	...	88.9	
Deductions	...	...	—	
Points gained	...	...	88.9	
Remarks and Awards	...	...		

CLASS 6.—LINCOLNSHIRE RED SHORTHORN HEIFERS (NOT EXCEEDING THREE YEARS).

Number ...	...	...	...	92	93	95	98
Name ...	...	...	...	Barton Ruby Spot 11th	Barton Daisy 3rd.	Barton Rose 14th.	Sudbrook No. 330.
Born ...	...	...	...	Oct. 3, 1911.	Feb. 24, 1912.	Sept. 3, 1911.	Oct. 2, 1911.
Number of Calves ...	...	...	...	...	...	...	...
Last Calved ...	...	...	...	Aug. 28, 54	Aug. 31, 51	Sept. 6, 45	July 29, 84
Days since Calving ...	...	...	...	...	...	...	...
Weight of Milk, 1st day	...	...	...	Morn Even	Morn Even	Morn Even	Morn Even
Weight of Milk, 2nd day	...	...	...	22-6 20-5	20-2 18-2	15-2 13-6	14-9 13-2
Total	...	...	...	24-4 21-3	20-8 17-8	15-6 13-2	15-0 13-3
Average	...	...	...	47-0 41-8	41-0 36-0	30-8 26-8	29-9 26-5
Percentage { Fat ...	...	...	...	23-5 20-9	20-5 18-0	15-4 13-4	14-9 13-2
Composition of { Solids other than Fat	...	...	...	2-49 3-23	2-70 3-28	3-50 4-16	3-87 4-08
Milk. { Solids ...	...	...	...	9-11 9-11	9-06 9-02	9-22 8-96	9-73 9-56
Actual weight of Fat, in lbs. ...	...	...	...	11-60 12-34	11-76 12-30	12-72 13-12	13-60 13-64
Calculation of Points multiply by 20	...	...	...	.58 .68	.55 .59	.54 .56	.57 .54
Actual weight of Solids other than Fat, in lbs.	...	...	...	11-6 13-6	11-0 11-8	10-8 11-2	11-4 10-8
Calculation of Points multiply by 4	...	...	...	2-14 1-90	1-86 1-63	1-42 1-20	1-45 1-26
Points { For time since Calving	...	...	...	8-6 7-6	7-44 6-52	5-7 4-8	5-80 5-04
For weight of Milk ...	...	...	...	1-4	1-1	.5	4-4
For weight of Fat ...	...	...	...	44-4	38-5	29-8	28-1
For weight of Solids other than Fat	...	...	...	25-2	22-8	22-0	22-2
Total ...	...	...	...	16-2	14-0	10-5	10-8
Deductions ...	...	...	...	87-2	76-4	61-8	65-5
Points gained	...	...	...	10-0	10	—	—
Remarks and Awards ...	...	...	...	77-2	66-4	61-8	65-5
	...	...	...	1st Prize.	2nd Prize.		



CLASS 7.—JERSEY COWS.

Number ...	...	...	99	100	101	102
Name ...	...	...	My Pallas.	Goldington Pipkinth.	Pamela 2nd.	Vigilance.
Born ...	...	...	Sept. 22, 1910.	July 6, 1911.	Jan. 26, 1909.	July 3, 1908.
Number of Calves ...	...	...	...	...	...	...
Last Calved ...	...	...	Aug. 17, 65	Sept. 14, 37	March 25, 210	Aug. 7, 55
Days since Calving ...	...	...	...	...	...	...
Weight of Milk, 1st day ...	...	...	Morn Even	Morn Even	Morn Even	Morn Even
Weight of Milk, 2nd day ...	...	...	20.9 19.0	11.1 13.3	15.5 14.1	26.4 22.0
Total ...	...	...	19.9 20.2	14.0 13.1	18.2 14.3	26.7 21.0
Average ...	...	...	40.8 39.2	25.1 26.4	33.7 28.4	53.1 43.0
Percentage { Fat ...	...	...	20.4 19.6	12.5 13.2	16.8 14.2	26.5 21.5
Composition of { Solids other than Fat	...	...	4.48 4.92	3.98 4.37	5.31 4.82	4.01 4.05
the Milk. { Solids ...	...	...	8.84 8.78	9.32 9.03	9.65 9.28	9.29 8.85
Actual weight of Fat, in lbs. ...	...	...	13.32 13.70	13.50 13.40	14.96 14.10	13.30 12.90
Calculation of Points multiply by 20	...	...	.91 .96	.50 .58	.89 .69	1.06 .87
Actual weight of Solids other than Fat, in lbs.	...	...	18.2 19.2	10.0 11.6	17.8 13.8	21.2 17.4
Calculation of Points multiply by 4	...	...	1.80 1.71	1.18 1.20	1.62 1.31	2.46 1.90
Points { For time since Calving ...	...	...	7.2 6.8	4.7 4.8	6.48 5.24	9.8 7.6
For weight of Milk ...	...	...	2.5	...	12.0	3.5
For weight of Fat ...	...	...	40.0	25.7	31.0	48.0
For weight of Solids other than Fat	...	...	37.4	21.6	31.6	38.6
Total ...	...	...	14.0	9.5	11.7	17.4
Deductions ...	...	...	93.9	50.8	86.3	107.5
Points gained	...	...	93.9	56.8	86.3	107.5
Remarks and Awards ...	...	...	...	...	...	2nd Prize.

CLASS 7.—JERSEY COWS—Continued.

Number ... Name ...	...	...	...	103 Queen of Trumps.	104 Sweet Birdie 2nd.	105 Favour's Fortune.	106 Beckington Helen.
Born ...	...	...	...	April 12, 1909.	Sept. 23, 1910.	May 8, 1908.	July 31, 1910.
Number of Calves ...	...	...	...	...	...	...	...
Last Calved ...	...	...	...	Aug. 11.	Sept. 30.	April 8.	June 10.
Days since Calving ...	...	...	...	71	21	196	133
Weight of Milk, 1st day ...	...	...	...	Morn Even	Morn Even	Morn Even	Morn Even
Weight of Milk, 2nd day ...	...	...	...	15.3 14.3	16.8 15.5	17.8 16.3	16.8 15.3
Total ...	...	...	...	16.5 13.8	17.6 16.4	18.3 15.2	16.0 14.1
Average ...	...	...	...	31.8 28.1	34.4 31.9	36.1 31.5	32.8 29.4
Percentage { Fat ...	...	...	...	15.9 14.0	17.2 15.9	18.0 15.7	16.4 14.7
Composition of { Solids other than Fat	...	...	...	4.82 4.40	4.79 5.22	4.71 5.94	4.41 5.00
the Milk. {	...	...	...	9.58 9.30	9.55 9.26	9.51 9.40	9.19 9.06
Actual weight of Fat, in lbs. ...	...	...	...	14.40 13.70	14.34 14.48	14.22 15.34	13.60 14.06
Calculation of Points multiply by 20	...	...	...	.76 .61	.82 .83	.85 .92	.72 .74
Actual weight of Solids other than Fat, in lbs.	...	...	...	15.2 12.2	16.4 16.6	17.0 18.4	14.4 14.8
Calculation of Points multiply by 4	...	...	...	1.52 1.30	1.64 1.47	1.71 1.47	1.5 1.38
{ For time since Calving ...	...	...	...	6.1 5.2	6.56 5.88	6.84 5.88	6.0 5.52
Points { For weight of Milk ...	...	...	...	3.1	—	12.0	9.3
{ For weight of Fat ...	...	...	...	29.9	33.1	33.7	31.1
{ For weight of Solids other than Fat	...	...	...	27.4	33.0	35.4	29.2
Total ...	...	...	...	11.3	12.7	12.7	11.5
Deductions ...	...	...	...	71.7	78.5	93.8	81.1
Points gained	...	...	...	—	—	—	—
Remarks and Awards ...	...	...	...	71.7	78.5	93.8	81.1

CLASS 7.—JERSEY COWS—Continued.

Number ...	...	...	110 Marionette.	111 Duckwing.	112 Heywood Bluebell.	113 Last of the Lilies.
Name ...	...	...	Oct. 3, 1904.	Aug. 30, 1910.	Mar. 16, 1906.	Mar. 2, 1911.
Born ...	...	...	May 17.	June 1.	May. 20.	April 27.
Number of Calves	...	...	157	142	154	177
Last Calved	...	...				
Days since Calving	...	...				
Weight of Milk, 1st day	...	...	Morn Even	Morn Even	Morn Even	Morn Even
Weight of Milk, 2nd day	...	...	22.7 19.4	18.6 18.4	21.7 19.8	17.1 15.8
Total	...	...	17.3 18.1	18.0 17.7	22.0 19.6	17.3 14.8
Average	...	...	40.0 37.5	36.6 36.1	43.7 39.4	34.4 30.6
Percentage	...	...	20.0 18.7	18.3 18.0	21.8 19.7	17.2 15.3
Composition of	...	...	4.71 5.81	5.45 6.61	4.99 5.58	4.42 5.13
the Milk.	...	...	9.33 9.03	9.53 9.19	9.49 9.36	9.38 9.27
Actual weight of Fat, in lbs.	...	...	14.04 14.84	14.98 15.80	14.48 14.94	13.80 14.40
Calculation of Points multiply by 20	...	...	.94 1.08	1.00 1.19	1.08 1.10	.76 .78
Actual weight of Solids other than Fat, in lbs.	...	...	18.9 21.6	20.00 23.80	21.60 22.00	15.20 15.60
Calculation of Points multiply by 4	...	...	1.86 1.69	1.75 1.65	2.07 1.85	1.61 1.42
Points	...	...	7.4 6.8	7.0 6.6	8.3 7.4	6.4 5.7
For time since Calving	...	...	11.7	10.2	11.4	12.0
For weight of Milk	...	...	38.7	36.3	41.5	32.5
For weight of Fat	...	...	40.4	43.8	43.6	30.8
For weight of Solids other than Fat	...	...	14.2	13.6	15.7	12.1
Total	...	...	105.0	103.9	112.2	87.4
Deductions	...	...	—	—	—	—
Points gained	...	...	105.0	103.9	112.2	87.4
Remarks and Awards	...	...	3rd Prize.	Reserve.	1st Prize.	

## CLASS 10.—GUERNSEY COWS.

Number ...	...	...	...	131	132	133	135
Name ...	...	...	...	Wickham Fancy 3rd.	Treacle 3rd.	Citron Blossom 25th.	Goldstream 5th.
Born ...	...	...	...	Dec. 18, 1909.	Jan. 14, 1909.	June 8, 1905.	Dec. 4, 1910.
Number of Calves ...	...	...	...	4			
Last Calved ...	...	...	...	Sept. 21.	April 27.	Oct. 4.	May 13.
Days since Calving ...	...	...	...	30	177	17	161
Weight of Milk, 1st day	...	...	...	Morn Even	Morn Even	Morn Even	Morn Even
Weight of Milk, 2nd day	...	...	...	18.0 16.7	19.5 14.3	19.6 16.2	18.6 13.8
Total	...	...	...	17.5 16.1	18.0 10.5	19.6 15.9	18.1 14.7
Average ...	...	...	...	35.5 32.8	37.5 24.8	39.2 32.1	36.7 28.5
Percentage { Fat ...	...	...	...	17.7 16.4	18.7 12.4	19.6 16.0	18.3 14.2
Composition of { Solids other than Fat	...	...	...	5.34 5.65	4.36 5.32	3.80 4.44	4.73 5.31
the Milk. { Solids ...	...	...	...	9.84 9.65	9.44 9.48	9.48 9.36	9.67 9.65
Actual weight of Fat, in lbs. ...	...	...	...	15.18 15.20	13.80 14.80	13.28 13.80	14.40 14.96
Calculation of Points multiply by 20	...	...	...	.94 .91	.81 .66	.75 .71	.87 .75
Actual weight of Solids other than Fat, in lbs.	...	...	...	18.8 18.2	16.2 13.2	15.0 14.2	17.4 15.0
Calculation of Points, multiply by 4	...	...	...	1.75 1.59	1.76 1.18	1.85 1.50	1.76 1.37
{ For time since Calving	...	...	...	7.0 6.36	7.04 4.72	7.40 6.0	7.04 5.48
{ For weight of Milk ...	...	...	...		12.0		12.0
{ For weight of Fat ...	...	...	...	34.1	31.1	35.6	32.5
{ For weight of Solids other than Fat	...	...	...	37.0	29.4	29.2	32.4
Total ...	...	...	...	13.4	11.8	13.4	12.5
Deductions ...	...	...	...	84.5	84.3	78.2	89.4
Points gained	...	...	...	84.5	84.3	78.2	89.4
Remarks and Awards ...	...	...	...				2nd Prize.

CLASS 10.—GUERNSEY COWS—Continued.

Number ...	Name ...	...	...	...	...	...	136		...	...	...	137		...
							Merton Beauty.	Merton Beauty.				Merton Dairymaid 5th	Merton Dairymaid 5th	
Born ...	...	...	...	...	...	...	Sept. 3, 1911.	Sept. 3, 1911.	...	...	...	Aug. 1, 1911.	Aug. 1, 1911.	...
Number of Calves ...	...	...	...	...	...	...	Sept. 12.	Sept. 12.	...	...	...	Sept. 20.	Sept. 20.	...
Last Calved ...	...	...	...	...	...	...	39	39	...	...	...	31	31	...
Days since Calving ...	...	...	...	...	...	...			...	...	...			...
Weight of Milk, 1st day ...	...	...	...	...	...	...	Morn	Morn	...	...	...	Even	Even	...
Weight of Milk, 2nd day ...	...	...	...	...	...	...	18.2	18.2	...	...	...	22.1	22.1	...
Total ...	...	...	...	...	...	...	19.9	19.9	...	...	...	22.6	22.6	...
Average ...	...	...	...	...	...	...	38.1	34.1	...	...	...	44.7	36.8	...
Percentage { Fat ...	...	...	...	...	...	...	19.0	17.0	...	...	...	22.3	18.4	...
Composition of { Solids other than Fat	...	...	...	...	...	...	3.80	4.04	...	...	...	5.11	5.62	...
the Milk. { Solids ...	...	...	...	...	...	...	9.20	9.10	...	...	...	9.61	9.54	...
Actual weight of Fat, in lbs. ...	...	...	...	...	...	...	13.0	13.14	...	...	...	14.72	15.16	...
Calculation of Points multiply by 20	...	...	...	...	...	...	.72	.69	...	...	...	1.14	1.03	...
Actual weight of Solids other than Fat, in lbs.	...	...	...	...	...	...	14.4	13.8	...	...	...	22.8	20.6	...
Calculation of Points multiply by 4	...	...	...	...	...	...	1.75	1.55	...	...	...	2.14	1.76	...
{ For time since Calving ...	...	...	...	...	...	...	7.0	6.20	...	...	...	8.56	7.04	...
{ For weight of Milk ...	...	...	...	...	...	...			...	...	...			...
{ For weight of Fat ...	...	...	...	...	...	...	36.0		...	...	...	40.7		...
{ For weight of Solids other than Fat	...	...	...	...	...	...	28.2		...	...	...	43.4		...
Total ...	...	...	...	...	...	...	13.2		...	...	...	15.6		...
Deductions ...	...	...	...	...	...	...	77.4		...	...	...	99.7		...
Points gained	...	...	...	...	...	...	77.4		...	...	...	99.7		...
Remarks and Awards ...	...	...	...	...	...	...			...	...	...			1st Prize.

## CLASS 12.—RED POLL COWS.

Number ...	143	145	146	147
Name ...	Mona.	Sudbourne Queen 1st.	Sudbourne Flight.	Sudbourne Cassia.
Born ...	Dec. 16, 1901.	Sept. 3, 1904.	May 9, 1909.	Aug. 7, 1909.
Number of Calves ...	—	8	—	—
Last Calved ...	June 28	Aug. 7	Oct. 4	Sept. 15.
Days since Calving ...	115	75	47	36
Weight of Milk, 1st day	Morn Even	Morn Even	Morn Even	Morn Even
Weight of Milk, 2nd day	25.9 19.0	36.9 28.3	34.4 30.9	27.1 22.5
Total	26.1 22.4	35.6 28.7	33.2 31.5	26.0 20.8
Average ...	52.0 41.4	72.5 57.0	67.6 62.4	53.1 43.3
Percentage (Fat ...	26.0 20.7	36.2 28.5	33.8 31.2	26.5 21.6
Composition of { Solids other than Fat	3.63 3.32	3.85 3.29	3.54 3.95	5.47 4.38
the Milk. { Solids ...	8.71 9.08	8.83 8.87	9.50 9.31	8.63 9.42
Actual weight of Fat, in lbs. ...	12.34 12.40	12.68 12.16	13.04 13.26	14.10 13.80
Calculation of Points multiply by 20	.94 .69	1.40 .94	1.20 1.23	1.45 .95
Actual weight of Solids other than Fat, in lbs.	18.8 13.8	28.0 18.8	24.0 24.60	29.0 19.0
Calculation of Points multiply by 4	2.26 1.88	3.20 2.52	3.22 2.90	2.29 2.03
Points { For time since Calving ...	7.5	3.5	.7	—
{ For weight of Milk ...	46.7	64.7	65.0	48.1
{ For weight of Fat ...	32.6	46.8	48.6	48.0
{ For weight of Solids other than Fat	16.6	22.9	24.5	17.3
Total ...	103.4	137.9	138.8	113.4
Deductions ...	—	—	—	—
Points gained	103.4	137.9	138.8	113.4
Remarks and Awards ...	H.C.	3rd Prize.	2nd Prize. Equal to 1st for Red Poll Society Prize. Reserve for Lord Mayor's Cham- pion Cup.	Reserve.

## Class 12.—RED POLL COWS—Continued.

Number ...	...	...	...	...	148
Name ...	...	...	...	...	Sudbourne Minnie.
Born ...	...	...	...	...	June 6, 1910.
Number of Calves	...	...	...	...	—
Last Calved	...	...	...	...	Oct. 2.
Days since Calving	...	...	...	...	19
Weight of Milk, 1st day	...	...	...	Morn	Eren
Weight of Milk, 2nd day	...	...	...	34.1	31.2
Total	...	...	...	38.5	33.4
Average	...	...	...	72.6	64.6
	...	...	...	36.3	32.3
Percentage { Fat ...	...	...	...	3.46	3.74
Composition of { Solids other than Fat	...	...	...	9.98	9.86
the Milk. { Solids	...	...	...	13.44	13.60
Actual weight of Fat, in lbs. ...	...	...	...	1.25	1.21
Calculation of Points multiply by 20	...	...	...	25.0	24.2
Actual weight of Solids other than Fat, in lbs.	...	...	...	3.60	3.18
Calculation of Points multiply by 4	...	...	...	14.40	12.72
Points { For time since Calving	...	...	...	—	68.6
{ For weight of Milk	...	...	...	—	49.2
{ For weight of Fat	...	...	...	—	27.1
{ For weight of Solids other than Fat	...	...	...	—	144.9
Total	...	...	...	—	—
Deductions	...	...	...	—	—
Points gained	...	...	...	—	—
Remarks and Awards	...	...	...	...	...

1st Prize. Equal first for  
 Red-Poll Soc. Prize Lamb  
 Mayor's Champion Cup  
 Sarum Challenge Cup  
 Reserve for Shirey Cup

## CLASS 13.—RED POLL HEIFERS (NOT EXCEEDING THREE YEARS).

Number ...	...	...	...	...	150		151		152		154	
					Sudbourne Ferry 1st.		Sudbourne Moonshine		Sudbourne Motel.		Ashmore Matron.	
Born ...	...	...	...	...	Feb. 17, 1912		Sept. 5, 1911.		Aug. 5, 1912.		Feb. 27, 1912.	
Number of Calves ...	...	...	...	...	Sept. 28.		Aug. 24.		Sept. 14.		Aug. 7.	
Last Calved ...	...	...	...	...	23		38		37		75	
Days since Calving ...	...	...	...	...								
Weight of Milk, 1st day ...	...	...	...	...	Morn	Even	Morn	Even	Morn	Even	Morn	Even
Weight of Milk, 2nd day ...	...	...	...	...	14.5	13.1	24.9	22.8	15.3	12.8	18.6	17.2
Total ...	...	...	...	...	14.5	13.6	25.8	22.9	15.1	13.6	19.8	17.5
Average ...	...	...	...	...	29.0	26.7	50.7	45.7	30.4	26.4	38.4	34.7
Percentage { Fat ...	...	...	...	...	14.5	13.3	25.3	22.8	15.2	13.2	19.2	17.3
Composition of { Solids other than Fat	...	...	...	...	4.04	3.99	3.0	3.27	3.86	3.58	2.28	2.36
the Milk. { Solids ...	...	...	...	...	9.50	9.43	9.40	9.27	9.52	9.58	8.82	8.76
Actual weight of Fat, in lbs. ...	...	...	...	...	13.54	13.42	12.40	12.54	13.38	13.16	11.10	11.12
Calculation of Points multiply by 20	...	...	...	...	.58	.53	.76	.75	.59	.47	.44	.41
Actual weight of Solids other than Fat, in lbs.	...	...	...	...	11.6	10.6	15.2	15.0	11.8	9.4	8.80	8.20
Calculation of Points multiply by 4	...	...	...	...	1.37	1.26	2.38	2.11	1.45	1.26	1.70	1.52
Points { For time since Calving ...	...	...	...	...	5.48	5.04	9.52	8.44	5.80	5.04	6.80	6.08
{ For weight of Milk ...	...	...	...	...	—	—	1.8	—	—	—	3.5	—
{ For weight of Fat ...	...	...	...	...	27.8	27.8	48.1	—	28.4	—	36.5	—
{ For weight of Solids other than Fat	...	...	...	...	22.2	22.2	30.2	—	21.2	—	17.0	—
Total ...	...	...	...	...	10.5	10.5	18.0	—	10.8	—	12.9	—
Deductions ...	...	...	...	...	60.5	60.5	98.1	—	60.4	—	69.9	—
Points gained	...	...	...	...	—	—	—	—	—	—	20.0	—
Remarks and Awards ...	...	...	...	...	60.5	60.5	98.1	—	60.4	—	49.9	—
	...	...	...	...	Reserve.	Reserve.	1st Prize.	—	High	—	Commendation.	—
	...	...	...	...	Awarded Red Poll Reserve for Red	Awarded Red Poll Reserve for Red	Society's Prize. Poll Soc. Prize.	—	—	—	—	—



CLASS 13.—RED POLL HEIFERS (NOT EXCEEDING THREE YEARS)—Continued.

Number ...	...	...	...	...	...	...	...	...	...	155	156	157
Name ...	...	...	...	...	...	...	...	...	...	Ashmoor Sunshine.	Kettleburgh Rosie 4th.	Kettleburgh Rosie 2nd.
Born ...	...	...	...	...	...	...	...	...	...	Mar. 26, 1912.	April 26, 1912.	Jan. 17, 1912.
Number of Calves	...	...	...	...	...	...	...	...	...	1	1	—
Last Calved	...	...	...	...	...	...	...	...	...	Aug. 13.	Aug. 21.	Sept. 6.
Days since Calving	...	...	...	...	...	...	...	...	...	69	61	645
<hr/>												
Weight of Milk, 1st day	...	...	...	...	...	...	...	...	...	Morn	Morn	Morn
Weight of Milk, 2nd day	...	...	...	...	...	...	...	...	...	Even	Even	Even
Total	...	...	...	...	...	...	...	...	...	16.1	16.1	14.8
Average	...	...	...	...	...	...	...	...	...	11.8	16.2	13.8
Percentage { Fat ...	...	...	...	...	...	...	...	...	...	16.9	16.2	16.1
Composition of { Solids other than Fat	...	...	...	...	...	...	...	...	...	16.2	16.2	14.3
the Milk. { Solids	...	...	...	...	...	...	...	...	...	33.0	32.4	30.9
Actual weight of Fat, in lbs. ...	...	...	...	...	...	...	...	...	...	16.5	16.2	15.4
Calculation of Points multiply by 20	...	...	...	...	...	...	...	...	...	11.4	16.2	14.0
Actual weight of Solids other than Fat, in lbs.	...	...	...	...	...	...	...	...	...	3.30	3.33	3.53
Calculation of Points multiply by 4	...	...	...	...	...	...	...	...	...	3.76	3.33	3.75
Points {	For time since Calving	...	...	...	...	...	...	...	...	8.98	8.93	9.69
	For weight of Milk	...	...	...	...	...	...	...	...	9.14	8.93	9.61
	For weight of Fat	...	...	...	...	...	...	...	...	12.90	12.26	13.12
	For weight of Solids other than Fat	...	...	...	...	...	...	...	...	.43	.54	.54
Total	...	...	...	...	...	...	...	...	...	.52	.54	.54
Deductions	...	...	...	...	...	...	...	...	...	10.4	10.8	10.8
Points gained	...	...	...	...	...	...	...	...	...	11.6	10.8	10.6
Remarks and Awards	...	...	...	...	...	...	...	...	...	1.40	1.45	1.46
	...	...	...	...	...	...	...	...	...	1.04	1.45	1.35
	...	...	...	...	...	...	...	...	...	5.60	6.0	5.84
	...	...	...	...	...	...	...	...	...	4.16	5.80	5.40
	...	...	...	...	...	...	...	...	...	2.9	2.1	.5
	...	...	...	...	...	...	...	...	...	26.9	32.7	29.4
	...	...	...	...	...	...	...	...	...	19.0	22.4	21.4
	...	...	...	...	...	...	...	...	...	9.8	11.8	11.2
	...	...	...	...	...	...	...	...	...	58.0	69.0	62.5
	...	...	...	...	...	...	...	...	...	—	—	—
	...	...	...	...	...	...	...	...	...	58.0	69.0	62.5
	...	...	...	...	...	...	...	...	...	—	—	—
	...	...	...	...	...	...	...	...	...	2nd Prize.	3rd Prize.	

## CLASS 15.—SOUTH DEVON COWS.

Number ... Name ...	...	...	...	...	158 Hika 3rd. May 12, 1906. Sept. 14. 37	159 Cherry 5th. Nov. 12, 1906. Sept. 19. 32	161 Princess 4th. Feb. 16, 1908. Sept. 1. 50	163 Mayflower 28th. Nov. 10, 1904. Aug. 1. 81
Born ...	...	...	...	...	Morn	Morn	Morn	Morn
Number of Calves ...	...	...	...	...	Even	Even	Even	Even
Last Calved ...	...	...	...	...	31.4	29.9	24.3	27.9
Days since Calving ...	...	...	...	...	26.0	26.2	20.1	25.3
	...	...	...	...	34.2	27.0	24.0	29.6
	...	...	...	...	60.6	52.5	40.5	51.5
	...	...	...	...	32.8	26.2	24.1	28.7
	...	...	...	...	30.3		20.2	25.7
Weight of Milk, 1st day ...	...	...	...	...	3.91	3.70	3.67	3.31
Weight of Milk, 2nd day ...	...	...	...	...	3.53	4.03	4.17	4.01
Total ...	...	...	...	...	9.39	8.80	9.55	9.41
Average ...	...	...	...	...	9.45	8.87	9.37	9.39
Percentage (Fat ...	...	...	...	...	13.30	12.90	13.22	12.40
Composition of Solids other than Fat	...	...	...	...	1.28	1.06	.88	.84
the Milk. (Solids ...	...	...	...	...	1.07	1.05		1.03
Actual weight of Fat, in lbs. ...	...	...	...	...	25.60	21.2	17.6	19.0
Calculation of Points multiply by 20	...	...	...	...	2.85	2.32	1.90	2.41
Actual weight of Solids other than Fat, in lbs.	...	...	...	...	12.32	11.40	9.20	10.80
Calculation of Points multiply by 4	...	...	...	...		9.28	7.60	9.6
Points { For time since Calving ...	...	...	...	...	63.1	—	1.0	4.1
{ For weight of Milk ...	...	...	...	...	47.0	54.6	44.3	54.4
{ For weight of Fat ...	...	...	...	...	23.7	42.2	34.4	39.6
{ For weight of Solids other than Fat	...	...	...	...	133.8	116.1	16.8	20.4
Total ...	...	...	...	...	—	—	98.5	118.5
Deductions ...	...	...	...	...	133.8	116.1	—	—
Points gained	...	...	...	...	—	—	98.5	118.5
Remarks and Awards ...	...	...	...	...	1st Prize.	3rd Prize.	2nd Prize.	2nd Prize.

Class 15.—SOUTH DEVON COWS.—Continued.

Number ...	...	...	...	...	164 Golden Cup.	165 Carnation.
Name ...	...	...	...	...	May 4, 1909.	Sept. 28, 1908.
Born ...	...	...	...	...	2	—
Number of Calves ...	...	...	...	...	June 3.	June 12.
Last Calved ...	...	...	...	...	140	131
Days since Calving ...	...	...	...	...		
Weight of Milk, 1st day	...	...	...	...	Morn Even	Morn Even
Weight of Milk, 2nd day	...	...	...	...	13.9 22.3	27.3 28.4
Total	...	...	...	...	18.8 24.0	30.0 25.3
Average ...	...	...	...	...	32.7 46.3	57.3 53.7
	...	...	...	...	16.3 23.1	28.6 26.8
Percentage { Fat ...	...	...	...	...	2.83 4.26	2.11 3.23
Composition of { Solids other than Fat	...	...	...	...	9.57 9.14	9.17 8.91
the Milk. { Solids	...	...	...	...	12.40 13.40	11.28 12.14
Actual weight of Fat, in lbs. ...	...	...	...	...	.46 .99	.58 .87
Calculation of Points multiply by 20	...	...	...	...	9.2 19.8	11.6 17.4
Actual weight of Solids other than Fat, in lbs.	...	...	...	...	1.55 2.10	2.62 2.40
Calculation of Points multiply by 4	...	...	...	...	6.20 8.40	10.48 9.60
Points { For time since Calving	...	...	...	...	10.0	9.1
{ For weight of Milk ...	...	...	...	...	39.4	55.4
{ For weight of Fat ...	...	...	...	...	29.0	29.0
{ For weight of Solids other than Fat	...	...	...	...	14.6	20.1
Total ...	...	...	...	...	93.0	113.6
Deductions ...	...	...	...	...	10.0	10.0
Points gained	...	...	...	...	83.0	103.6
Remarks and Awards ...	...	...	...	...		Reserve.

## CLASS 18.—BRITISH HOLSTEIN COWS.

Number ...	...	...	167	168	169	171
Name ...	...	...	Gorstage Gelder.	Gorstage Goudsteen.	Colton Pippin.	Park Buttercup.
Born ...	...	...	July 18, 1909.	Unknown.	June 13, 1908.	1905.
Number of Calves ...	...	...	4	3	2	—
Last Calved ...	...	...	April 9.	July 11.	Sept. 20.	Mar. 12.
Days since Calving ...	...	...	195	102	31	223
Weight of Milk, 1st day ...	...	...	Morn Even	Morn Even	Morn Even	Morn Even
Weight of Milk, 2nd day ...	...	...	7.9 6.3	30.0 24.7	26.9 24.4	19.7 16.2
Total ...	...	...	8.0 6.9	29.6 24.4	27.2 26.1	21.4 16.5
Average ...	...	...	15.9 13.2	59.6 49.1	54.1 50.5	41.1 32.7
Percentage { Fat ...	...	...	7.9 6.6	29.8 24.5	27.0 25.2	20.5 16.3
Composition of { Solids other than Fat	...	...	4.01 3.87	2.92 3.43	2.27 3.32	5.13 4.23
the Milk. { Solids ...	...	...	8.89 9.13	8.84 8.77	8.50 8.88	9.47 9.23
Actual weight of Fat, in lbs. ...	...	...	12.80 13.0	11.56 12.20	10.77 12.20	14.60 13.46
Calculation of Points multiply by 20	...	...	.31 .25	.87 .84	.61 .84	1.05 .69
Actual weight of Solids other than Fat, in lbs.	...	...	6.2 5.0	17.4 16.8	12.2 16.8	21.0 13.8
Calculation of Points multiply by 4	...	...	.70 .60	2.58 2.14	2.30 2.24	1.94 1.50
Points { For time since Calving ...	...	...	2.80 2.40	10.32 8.56	9.20 8.96	7.76 6.00
{ For weight of Milk ...	...	...	12.0	6.2	—	12.0
{ For weight of Fat ...	...	...	14.5	54.3	52.2	36.8
{ For weight of Solids other than Fat	...	...	11.2	34.2	29.0	34.8
Total ...	...	...	5.2	18.9	18.2	13.8
Deductions ...	...	...	42.9	113.6	99.4	97.4
Points gained	...	...	—	10.0	10.0	—
Remarks and Awards ...	...	...	42.9	103.6	89.4	97.4

CLASS 18.—BRITISH HOLSTEIN COWS—Continued.

Number ...	Name ...	...	...	...	...	175		176	
						Penshurst Beauty.		Waltham Plum.	
Born ...	...	...	...	...	...	1910.		1909.	
Number of Calves ...	...	...	...	...	...	—		—	
Last Calved ...	...	...	...	...	...	July 24.		Aug. 15.	
Days since Calving ...	...	...	...	...	...	89		67	
<hr/>						Morn	Even	Morn	Even
Weight of Milk, 1st day	...	...	...	...	...	19.1	18.4	24.5	22.8
Weight of Milk, 2nd day	...	...	...	...	...	20.3	18.0	25.3	21.9
Total ...	...	...	...	...	...	39.4	36.4	49.8	44.7
Average	...	...	...	...	...	19.7	18.2	24.9	22.3
<hr/>						Morn	Even	Morn	Even
Percentage { Fat ...	...	...	...	...	...	2.37	3.70	2.37	3.01
Composition of { Solids other than Fat	...	...	...	...	...	9.17	8.70	9.29	9.09
the Milk. { Solids ...	...	...	...	...	...	11.54	12.40	11.66	12.10
Actual weight of Fat, in lbs. ...	...	...	...	...	...	.46	.67	.59	.67
Calculation of Points multiply by 20	...	...	...	...	...	9.20	13.4	11.8	13.4
<hr/>						Morn	Even	Morn	Even
Actual weight of Solids other than Fat, in lbs.	...	...	...	...	...	1.80	1.60	2.30	2.02
Calculation of Points multiply by 4 ...	...	...	...	...	...	7.20	6.40	9.20	8.08
<hr/>						4.9		2.7	
Points {	For time since Calving	...	...	...	...	37.9		47.2	
	For weight of Milk ...	...	...	...	...	22.6		25.2	
	For weight of Fat ...	...	...	...	...	13.6		17.3	
	For weight of Solids other than Fat	...	...	...	...	79.0		92.4	
Total						10.0		10.0	
Deductions						69.0		82.4	
Points gained									
<hr/>									
Remarks and Awards ...	...	...	...	...	...				

## CLASS 24.—GOATS.

Number ...	...	...	...	235	236	238	239
Name ...	...	...	...	Leazes Lupin.	Wignore Cornflower.	Halton Hairbell.	Halton Hecuba.
Born ...	...	...	...	Feb. 11, 1911	Jan. 23, 1910.	Jan. 22, 1912.	Mar. 13, 1912.
Number of Kids ...	...	...	...	...	2	...	...
Last Kided ...	...	...	...	June 16.	Aug. 1.	Feb. 26.	Aug. 24.
Days since Kidding ...	...	...	...	127	81	237	58
Weight of Milk, 1st day	...	...	...	Morn	Morn	Morn	Morn
Weight of Milk, 2nd day	...	...	...	Even	Even	Even	Even
Total ...	...	...	...	2-3 1-9	3-9 3-2	3-3 2-7	2-7 1-8
Average ...	...	...	...	2-3 1-6	4-5 3-5	3-7 3-1	2-7 2-4
Percentage { Fat ...	...	...	...	4-6 3-5	8-4 6-7	7-0 5-8	5-4 4-2
Composition of { Solids other than Fat	...	...	...	2-3 1-7	4-2 3-3	3-5 2-9	2-7 2-1
the Milk. { Solids ...	...	...	...	5-26 5-41	2-80 2-94	3-12 3-42	3-99 5-75
Actual weight of Fat, in lbs. ...	...	...	...	9-44 9-37	8-90 8-88	8-94 8-84	9-29 8-93
Calculation of Points multiply by 20	...	...	...	14-70 14-78	11-70 11-82	12-06 12-26	13-28 14-98
Actual weight of Solids other than Fat, in lbs.	...	...	...	.12 .092	.117 .097	.109 .099	.108 .121
Calculation of Points multiply by 4	...	...	...	2-40 1-84	2-34 1-94	2-18 1-98	2-16 2-42
Points { For time since Kidding ...	...	...	...	.21 .16	.374 .292	.312 .257	.251 .187
{ For weight of Milk ...	...	...	...	.84 .64	1-496 1-168	1-248 1-028	1-004 .748
{ For weight of Fat ...	...	...	...	2-11	1-35	3-95	—
{ For weight of Solids other than Fat	...	...	...	4-0	7-50	6-40	4-80
Total ...	...	...	...	4-24	4-28	4-16	4-58
Deductions ...	...	...	...	1-48	2-66	2-27	1-75
Points gained	...	...	...	11-83	15-79	16-78	11-13
Remarks and Awards ...	...	...	...	—	2-00	2-0	1-00
...	...	...	...	11-83	13-79	14-78	10-13
...	...	...	...	Reserve for	Reserve in Class.	3rd Prize.	...
...	...	...	...	Baroness Burdett.	...	...	...
...	...	...	...	Countess Challenge Cup.	...	...	...

CLASS 24.—GOATS—Continued.

Number Name	...	...	...	...	...	240 Brochuine Marsh-Maiden Mar. 26, 1911. 219	248 Brochuine Marsh-Maiden Feb. 24, 1910. 182	249 Fenchurch Hyacinth. Mar. 14, 1912. 2	250 Fenchurch Rose. May 7, 1908. 14 June 20. 123
Born	...	...	...	...	...	Mar. 16. 219	April 22. 182	July 1. 112	
Number of Kids	...	...	...	...	...				
Last Kidled	...	...	...	...	...				
Days since Kidding	...	...	...	...	...				
Weight of Milk, 1st day	...	...	...	...	...	Morn Even 2.4 1.8 2.3 2.0 4.7 3.8 2.3 1.9	Morn Even 3.1 2.3 3.0 2.3 6.1 4.6 3.0 2.3	Morn Even 1.7 1.1 1.8 1.4 3.5 2.5 1.7 1.2	Morn Even 1.7 1.4 1.5 1.3 3.2 2.7 1.6 1.3
Weight of Milk, 2nd day	...	...	...	...	...				
Total	...	...	...	...	...				
Average	...	...	...	...	...				
Percentage of Fat	...	...	...	...	...	2.72 2.32 8.26 8.38 10.98 10.70 .062 .044 1.24 .88 .190 .16 .760 .64	4.30 4.29 9.24 9.01 13.54 13.30 .13 .099 2.60 1.98 .278 .208 1.112 .832	7.25 7.08 10.31 10.18 17.56 17.26 .123 .085 2.46 1.70 .175 .122 .700 .488	7.36 7.72 10.24 10.20 17.60 17.92 .118 .100 2.36 2.0 .164 .133 .656 .532
Composition of Solids other than Fat	...	...	...	...	...				
the Milk.	...	...	...	...	...				
Actual weight of Fat, in lbs.	...	...	...	...	...				
Calculation of Points multiply by 20	...	...	...	...	...				
Actual weight of Solids other than Fat, in lbs.	...	...	...	...	...				
Calculation of Points multiply by 4	...	...	...	...	...				
For time since Kidding	...	...	...	...	...	3.65 4.20 2.12 1.40 11.37	3.03 5.30 4.58 1.94 14.85	1.86 2.90 4.16 1.19 10.11	2.05 2.90 4.36 1.19 10.50
For weight of Milk	...	...	...	...	...				
For weight of Fat	...	...	...	...	...				
For weight of Solids other than Fat	...	...	...	...	...				
Total	...	...	...	...	...	2.00	14.85	10.11	10.50
Deductions	...	...	...	...	...				
Points gained	...	...	...	...	...	9.37			
Remarks and Awards	...	...	...	...	...		2nd Prize.		

## CLASS 24.—GOATS—Continued.

Number Name	255 Wigmore Tare.	259 Leazes Lustre.	260 Leazes Libertine.	265 Cophorne Almond.
	April 6, 1912. July 15. 98	May 30, 1910. July 14. 99	April 6, 1911. Aug. 29. 53	Mar. 6, 1912. June 28. 115
Born	...	...	...	...
Number of Kids	...	...	...	...
Last Kided	...	...	...	...
Days since Kidding	...	...	...	...
Weight of Milk, 1st day	Morn Even	Morn Even	Morn Even	Morn Even
Weight of Milk, 2nd day	2.5 2.2	3.1 2.2	2.5 2.4	2.9 2.9
Total	2.6 2.2	3.0 2.7	2.3 1.9	3.5 3.1
Average	5.1 4.4	6.1 4.9	4.8 4.3	6.4 6.0
Percentage (Fat ...	2.5 2.2	3.0 2.4	2.4 2.1	3.2 3.0
Composition of (Solids other than Fat	4.04 4.73	2.10 4.06	4.81 2.62	3.23 4.31
the Milk. (Solids ...	10.34 10.11	8.80 9.10	9.05 8.68	9.39 9.15
Actual weight of Fat, in lbs. ...	14.38 14.84	10.90 13.16	13.86 11.30	12.62 13.46
Calculation of Points multiply by 20	.101 .104	.063 .097	.115 .055	.103 .129
Actual weight of Solids other than Fat, in lbs	2.02 2.08	1.26 1.94	2.30 1.10	2.06 2.58
Calculation of Points multiply by 4	.26 .222	.264 .218	.217 .182	.300 .274
Points { For time since Kidding For weight of Milk ... For weight of Fat ... { For weight of Solids other than Fat Total ... Deductions ... Points gained	1.040 .888	1.056 .872	.868 .728	1.200 1.096
	1.63	1.65	—	1.91
	4.70	5.40	4.50	6.20
	4.10	3.20	3.40	4.64
	1.93	1.93	1.60	2.30
Remarks and Awards ...	12.36	12.18	9.50	15.05
	—	1.0	1.00	1.00
	12.36	11.18	8.50	14.05
	High Commendation.			4th Prize.



CLASS 23.—GOATS—Continued.

Number ...	...	...	...	...	266	267
Name ...	...	...	...	...	Hawthorne Granite.	Wood Lily.
Born ...	...	...	...	...	Mar. 31, 1908.	Mar. 4, 1904.
Number of Kids ...	...	...	...	...	—	—
Last Kiddled ...	...	...	...	...	Mar. 14.	May 27.
Days since Kidding ...	...	...	...	...	221	147
Weight of Milk, 1st day ...	...	...	...	...	Morn Even	Morn Even
Weight of Milk, 2nd day ...	...	...	...	...	3.2 2.4	2.2 1.8
Total ...	...	...	...	...	3.5 2.4	2.3 1.8
Average ...	...	...	...	...	6.7 4.8	4.5 3.6
Percentage (Fat ...	...	...	...	...	3.3 2.4	2.2 1.8
Composition of (Solids other than Fat	...	...	...	...	4.78 4.96	5.99 6.07
the Milk. (Solids ...	...	...	...	...	9.82 9.78	9.51 9.37
Actual weight of Fat, in lbs. ...	...	...	...	...	14.60 14.74	15.50 15.44
Calculation of Points multiply by 20 ...	...	...	...	...	.158 .120	.132 .110
Actual weight of Solids other than Fat, in lbs. ...	...	...	...	...	3.16 2.40	2.64 2.20
Calculation of Points multiply by 4 ...	...	...	...	...	.324 .236	.210 .168
Points { For time since Kidding ...	...	...	...	...	1.296 .944	.340 .672
For weight of Milk ...	...	...	...	...	3.68	2.45
For weight of Fat ...	...	...	...	...	5.70	4.0
For weight of Solids other than Fat ...	...	...	...	...	5.56	4.84
Total ...	...	...	...	...	2.24	1.51
Deductions ...	...	...	...	...	17.18	12.80
Points gained ...	...	...	...	...	17.18	12.80
Remarks and Awards ...	...	...	...	...	1st Prize and Baroness Burdett- Coutts Challenge Cup.	High Commendation.

## THE BUTTER TESTS, 1914.

By R. H. EVANS, B.Sc.,

Madryn Castle Farm School, Pwllheli, N. Wales.

The 1914 Butter Tests were carried out on similar lines to those obtaining in previous years. The standard of points for the various breeds were, however, slightly different to those followed in the 1913 tests. The points for Pedigree Shorthorns were raised from 28 and 32, to 30 and 34 respectively. The standard for British Holsteins was included for the first time, the figures adopted being the same as those for Shorthorns, viz., 30 and 34. The standard for Jersey Cows over five years old was reduced from 35 to 34. With these exceptions, the standards in 1914 were the same as those of 1913.

The number of entries in 1914 were as follows:—

Pedigree Shorthorns	...	...	...	...	...	...	14
Non-Pedigree Shorthorns	...	...	...	...	...	...	14
Lincoln Red Shorthorns	...	...	...	...	...	...	6
Holsteins	...	...	...	...	...	...	1
Jerseys	...	...	...	...	...	...	11
Guernseys	...	...	...	...	...	...	5
South Devons	...	...	...	...	...	...	8

Of a total of 59 cows entered, only 45 were actually tested—17 less than in 1913.

The following are the scale of points and the revised standard of points for the various breeds :

One point for every ounce of butter ; one point for every completed 10 days since calving, deducting the first 40 days. Maximum allowance for period of lactation, 12 points.

Fractions of ounces of butter, and incomplete periods of less than 10 days, to be worked out in decimals, and added to the total points.

In the case of cows obtaining the same number of points, the prize to be awarded to the cow that has been the longest period in milk.

No prize will be given to animals competing in the Butter Tests which do not come up to the following standard :—

Breed.	Cows under 5 years. Points.	Cows 5 years and over. Points.
Pedigree Shorthorns ... ..	30	34
Non-Pedigree Shorthorns ... ..	30	34
British Holsteins ... ..	30	34
Lincoln Red Shorthorns ... ..	30	34
Jerseys ... ..	30	34
Guernseys ... ..	27	30
Ayrshires ... ..	27	30
Red Polls ... ..	27	30
South Devons ... ..	30	34
Kerries ... ..	26	29
Dexter Kerries ... ..	26	29

Certificates of Merit, and Highly commended cards will be given to animals other than prize winners, that reach the above standard.

In the Shorthorn class, Mr. Moffatt's cow, "Daisy Bella 9th," and Mr. Raingill's "Liberty" deserve special mention. The former yielded 3 lbs. of butter, and the other 2 lbs. 15½ ozs. respectively, in 24 hours—the butter ratio in the one case being 1 in 18·44, and in the other 1 in 19·91—a very creditable performance.

In order to enable our readers to compare the total result of the test from year to year, we append the following table :—

Year.	Total No. of Cows.	Average weight of 24 hours' Milk.	Average Yield of Butter.	Average Butter Ratio.	Average No. of Points.
		lbs.	lbs. ozs.		
1909 .. ..	61	42	1 12½	23·51	33·30
1910 .. ..	62	44	1 12½	25·03	32·50
1911 .. ..	55	43½	1 11	25·87	30·90
1912 .. ..	54	49½	1 14½	25·82	33·08
1913 .. ..	62	42	1 9½	26·05	29·26
1914 .. ..	45	45½	1 12¼	25·67	31·69

My best thanks are due to my colleagues, Mr. T. W. Hammond and Mr. L. J. Craufurd, representing the Jersey Cattle Society, for assistance rendered in conducting the tests.

TABLE I.—NUMBER OF CATTLE TESTED SINCE 1897.

Breed	1897	1898	1899	1900	1901	1902	1903	1904	1905	1906	1907	1908	1909	1910	1911	1912	1913	1914
Shorthorns	9	23	21	22	15	31	18	14	17	22	26	26	19	22	26	30	26	20
Lincoln Reds	—	—	—	—	—	—	—	—	—	—	7	9	8	8	6	6	5	4
Jerseys .....	14	17	15	29	25	30	20	12	18	13	13	16	22	18	18	7	18	9
Guernseys	3	5	4	7	8	1	5	3	3	2	2	2	2	2	1	2	6	5
Red Polls ...	7	4	9	7	2	6	5	4	11	12	11	3	4	4	1	1	—	—
Ayrshires ...	3	1	2	—	1	1	—	1	3	2	—	4	—	1	—	4	—	—
Sth. Devons	—	—	—	—	—	—	2	2	3	5	—	—	4	7	2	4	2	6
Dutch .....	1	—	—	—	—	—	1	—	—	—	—	—	—	—	—	—	—	—
Kerries and Dexters	—	1	2	—	1	2	—	2	1	2	2	5	2	—	1	—	5	—
Welsn .....	—	1	1	1	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Cross-breds	4	1	6	2	2	11	8	6	8	10	—	—	—	—	—	—	—	—
Holsteins ...	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1
	41	53	60	68	54	82	59	44	64	68	61	65	61	62	55	54	62	45

TABLE II.—NUMBER OF CATTLE OF THE VARIOUS BREEDS TESTED SINCE 1895, WITH THEIR AVERAGE PERIOD OF LACTATION, WEIGHT OF BUTTER, BUTTER RATIOS, AND POINTS.

Year	No.	Breed	Average No. of Days in Milk	Average Weight of Butter	Average Butter Ratio	Average No. of Points
				lbs. ozs.	lbs.	
From 1895 to 1900	106	Shorthorns ...	50½	1 11	28.81	—
1901 .....	15	" ...	44	2 0½	26.69	33.69
1902 .....	31	" ...	50	1 11½	27.38	23.89
1903 .....	18	" ...	41	1 11	38.59	28.44
1904 .....	14	" ...	41½	1 10	29.31	27.47
1905 .....	17	" ...	53	1 13½	27.65	31.25
1906 .....	22	" ...	58	1 6½	32.87	25.08
1907 .....	26	" ...	62	1 11½	29.23	30.24
1908 .....	*35	" ...	49	1 11	29.39	28.05
1909 .....	19	" ...	54	1 14	27.25	32.31
1910 .....	22	" ...	43	1 13½	27.53	31.39
1911 .....	26	" ...	39	1 12½	28.42	29.28
1912 .....	30	" ...	44	2 0½	26.58	33.75
1913 .....	26	" ...	38	1 10½	31.45	27.54
1914 .....	20	" ...	40	1 13½	27.61	29.50
1907 .....	7	Lincoln Reds	57	1 13½	28.31	31.91
1908 .....	9	" ...	61	1 12	28.00	30.60
1909 .....	8	" ...	44	1 14½	24.81	32.09
1910 .....	8	" ...	79	1 10½	27.15	31.39
1911 .....	6	" ...	78	1 11	27.03	30.97
1912 .....	6	" ...	36	1 14½	26.72	30.92
1913 .....	5	" ...	44	1 13½	27.78	29.72
1914 .....	4	" ...	49	1 9½	30.21	27.37
„ 1895 to 1900	126	Jerseys ...	99	1 10½	19.15	—
1901 .....	25	" ...	141	1 9½	17.80	34.44
1902 .....	30	" ...	124	1 10	18.46	33.19
1903 .....	20	" ...	141	1 11	18.12	36.13
1904 .....	12	" ...	117	1 13½	19.62	36.79
1905 .....	18	" ...	134	1 10½	19.48	35.51
1906 .....	13	" ...	119	1 10½	20.89	33.49
1907 .....	13	" ...	111	1 11	19.71	34.49
1908 .....	16	" ...	115	1 7½	22.35	30.00
1909 .....	22	" ...	116	1 13½	18.36	37.12
1910 .....	18	" ...	123	1 13½	18.43	37.05
1911 .....	18	" ...	116	1 11½	19.98	34.11
1912 .....	7	" ...	143	2 1	18.26	40.77
1913 .....	18	" ...	136	1 10½	19.24	35.85
1914 .....	9	" ...	142	1 15	18.77	40.12
„ 1895 to 1900	23	Guernseys ...	71½	1 9½	21.86	—
1901 .....	8	" ...	81	1 8½	21.43	29.51
1902 .....	1	" ...	17	1 3½	21.46	19.75
1903 .....	5	" ...	52	1 1	27.77	18.93
1904 .....	3	" ...	98½	1 10	20.65	31.91
1905 .....	3	" ...	165½	1 6½	19.66	31.78
1906 .....	2	" ...	138	1 3½	27.00	28.45

TABLE II.—NUMBER OF CATTLE OF THE VARIOUS BREEDS TESTED SINCE 1895, WITH THEIR AVERAGE PERIOD OF LACTATION, WEIGHT OF BUTTER, BUTTER RATIOS, AND POINTS—*Continued.*

Year	No.	Breed	Average No. of Days in Milk	Average Weight of Butter	Average Butter Ratio	Average No. of Points
				lbs. ozs.	lbs.	
1907 .....	2	Guernseys ...	82	1 12 $\frac{1}{2}$	18-90	33-48
1908 .....	2	" ...	142	1 13 $\frac{1}{2}$	19-47	37-90
1909 .....	2	" ...	66	1 9 $\frac{1}{2}$	21-13	28-27
1910 .....	2	" ...	57	1 3 $\frac{1}{2}$	26-80	21-93
1911 .....	1	" ...	181	0 14	39-28	26-00
1912 .....	2	" ...	53	1 2 $\frac{1}{2}$	24-32	26-55
1913 .....	6	" ...	139	1 6 $\frac{1}{2}$	21-94	30-66
1914 ...	5	" ...	110	1 6 $\frac{1}{2}$	21-88	29-53
From 1895 to 1900	30	Red Polls ...	60 $\frac{1}{2}$	1 4 $\frac{1}{2}$	30-29	—
1901 .....	2	" ...	80	1 8 $\frac{1}{2}$	25-50	28-77
1902 .....	6	" ...	83	1 6 $\frac{1}{2}$	26-84	26-92
1903 .....	5	" ...	124	1 0	39-60	21-39
1904 .....	4	" ...	115 $\frac{1}{2}$	1 5 $\frac{1}{2}$	30-34	29-06
1905 .....	11	" ...	74 $\frac{1}{2}$	1 3 $\frac{1}{2}$	28-78	22-76
1906 .....	12	" ...	76	0 15	39 15	18-81
1907 .....	11	" ...	90	1 2 $\frac{1}{2}$	33-21	23-96
1908 .....	3	" ...	92	1 1	35-00	22-16
1909 .....	4	" ...	86	1 4 $\frac{1}{2}$	32-73	25-37
1910 .....	4	" ...	78	1 4 $\frac{1}{2}$	30-81	24-35
1911 .....	1	" ...	76	0 15	36-60	18-60
1912 .....	1	" ...	26	1 0	43-80	16-00
1913 .....	—	" ...	—	—	—	—
" 1895 to 1900	8	Ayrshires ...	52	1 13 $\frac{1}{2}$	26-35	—
1901 .....	1	" ...	125	1 7 $\frac{1}{2}$	27-65	32-10
1902 .....	1	" ...	33	1 3 $\frac{1}{2}$	18-00	19-50
1903 .....	—	" ...	—	—	—	—
1904 .....	1	" ...	116	0 12 $\frac{1}{2}$	35-20	20-10
1905 .....	3	" ...	77	1 2 $\frac{1}{2}$	28-07	22-88
1906 .....	2	" ...	23	1 11 $\frac{1}{2}$	25-51	27-70
1907 .....	—	" ...	—	—	—	—
1908 .....	4	" ...	75	1 2	35-19	21-00
1909 .....	—	" ...	—	—	—	—
1910 .....	1	" ...	88	1 15	25-93	35-80
1911 .....	—	" ...	—	—	—	—
1912 .....	4	" ...	71	1 5 $\frac{1}{2}$	32-52	24-65
1913 .....	—	" ...	—	—	—	—
1909 .....	4	South Devons	105	1 13 $\frac{1}{2}$	24-77	33-66
1910 .....	7	" ...	91	1 11 $\frac{1}{2}$	29-33	32-87
1911 .....	3	" ...	144	1 5	38-98	31-52
1912 .....	4	" ...	90	1 15 $\frac{1}{2}$	26-51	36-74
1913 .....	2	" ...	62	1 8 $\frac{1}{2}$	30-96	26-60
1914 .....	6	" ...	78	1 12	28-85	32-11

TABLE II.—NUMBER OF CATTLE OF THE VARIOUS BREEDS TESTED SINCE 1895, WITH THEIR AVERAGE PERIOD OF LACTATION, WEIGHT OF BUTTER, BUTTER RATIOS, AND POINTS—*Continued.*

Year	No.	Breed	Average No. of Days in Milk	Average Weight of Butter	Average Butter. Ratio	Average No. of Points
From 1895 to 1900	3	Dexters and Kerries	117	lbs. 0 ozs. 14½	lbs. 40.80	—
1901 .....	1	" ...	83	1 6½	21.17	26.55
1902 .....	2	" ...	46	1 7½	21.28	23.49
1903 .....	—	" ...	—	—	—	—
1904 .....	2	" ...	72	0 14½	21.31	18.45
1905 .....	1	" ...	149	1 1½	23.47	28.15
1906 .....	2	" ...	33	1 13	22.40	29.10
1907 .....	2	" ...	65	1 11½	21.06	29.70
1908 .....	5	" ...	124	1 6	24.47	29.13
1909 .....	2	Kerries ...	75	1 6	20.86	25.65
1910 .....	—	" ...	—	—	—	—
1911 .....	1	" ...	162	1 3½	28.51	31.50
1912 .....	—	" ...	—	—	—	—
1913 .....	5	" ...	43	1 3	25.98	19.70
1914 .....	—	" ...	—	—	—	—
1914 .....	1	Holsteins ...	102	1 3½	44.87	25.70

TABLE III.—AVERAGE YIELD OF BUTTER OF THE DIFFERENT BREEDS AT DIFFERENT PERIODS.

Year	Breed	No. of Cows	Days in Milk, 50	No. of Cows	Days in Milk, 100	No. of Cows	Days in Milk, 135	No. of Cows	Days in Milk, 190
1895 to			lbs. ozs.		lbs. ozs.		lbs. ozs.		lbs. ozs.
1900	Shorthorns	19	1 12½	6	1 7½	2	1 4½	8	1 1½
1901	"	2	1 8	—	—	1	2 6	—	—
1902	"	6	1 10½	—	—	1	1 11	—	—
1903	"	3	1 7	—	—	1	1 6½	—	—
1904	"	3	1 10½	1	1 14½	—	—	—	—
1905	"	2	1 1	1	2 0½	2	1 7½	—	—
1906	"	11	1 8½	3	1 3½	—	—	—	—
1907	"	11	1 9½	2	1 9½	1	0 15½	—	—
1908	"	11	1 11½	—	—	2	1 12	—	—
1909	"	11	2 0½	5	1 11½	3	1 8½	—	—
1910	"	16	1 14½	5	2 1	1	1 3½	—	—
1911	"	20	1 13	6	1 9½	—	—	—	—
1912	"	23	2 2½	6	1 8½	1	1 14	—	—
1913	"	20	1 11	5	1 8½	1	1 5	—	—
1914	"	17	1 15	1	0 12	2	1 7½	—	—
1907	Lincoln Reds	3	1 12	1	1 11	—	—	—	—
1909	"	6	2 1	1	1 9½	1	1 7	—	—
1910	"	4	1 10½	—	—	3	1 10½	1	1 13½
1911	"	4	1 10½	—	—	—	—	2	1 12
1912	"	5	1 15½	1	1 8½	—	—	—	—
1913	"	5	1 13½	—	—	—	—	—	—
1914	"	3	1 9	1	1 12	—	—	—	—
1895 to									
1900	Jerseys	23	1 10½	15	1 8½	11	1 8½	31	1 10½
1901	"	1	1 12	8	1 7½	6	1 9	12	1 10½
1902	"	4	1 9½	3	1 8½	2	1 14	9	1 11
1903	"	4	1 9½	5	1 15	9	1 9½	2	1 9½
1904	"	2	1 10½	3	2 2½	4	2 0½	1	1 13½
1905	"	3	1 8½	4	1 15½	8	1 9½	2	1 8½
1906	"	5	1 10½	3	1 3½	4	1 15½	1	1 5½
1907	"	6	1 13½	2	1 7½	3	1 13	1	1 4½
1908	"	4	1 14½	3	1 10	4	1 1	2	1 2
1909	"	3	1 3	4	2 2½	6	1 14½	9	1 12
1910	"	2	1 10½	5	1 13½	2	1 15½	7	1 13½
1911	"	3	1 0½	6	1 11	1	2 5½	4	1 12½
1912	"	—	—	2	1 8½	2	2 1	—	—
1913	"	1	1 5½	5	1 11	1	1 12	8	1 7
1914	"	1	1 8	1	2 1½	1	1 10	4	2 1
1895 to									
1900	Guernseys	3	1 7½	4	1 7½	3	1 4½	1	1 8
1901	"	1	1 15½	2	1 5½	—	—	2	1 8½
1902	"	—	—	—	—	—	—	—	—
1903	"	2	0 15½	—	—	—	—	—	—
1904	"	2	1 6½	—	—	1	2 0½	—	—
1905	"	1	1 10½	—	—	1	1 12½	1	0 13½
1906	"	—	—	1	1 1	1	1 5½	—	—
1907	"	—	—	—	—	—	—	1	1 14
1908	"	1	1 13	—	—	—	—	1	1 14
1909	"	1	1 11	1	1 8½	—	—	—	—
1910	"	1	1 3½	1	1 3½	—	—	—	—
1911	"	—	—	—	—	—	—	1	0 14
1912	"	1	1 3	1	1 2	—	—	—	—
1913	"	1	1 8	1	1 6½	1	1 12	—	—
1914	"	2	1 11	—	—	—	—	3	1 3½



TABLE III.—AVERAGE YIELD OF BUTTER OF THE DIFFERENT BREEDS AT DIFFERENT PERIODS—*Continued.*

Year	Breed	No. of Cows	Days in Milk, 50	No. of Cows	Days in Milk, 100	No. of Cows	Days in Milk, 135	No. of Cows	Days in Milk, 190
1895 to 1900	Red Polls	10	lbs. ozs. 1 4½	2	lbs. ozs. 1 8	2	lbs. ozs. 0 12½	1	lbs. ozs. 0 11
1901	"	—	—	2	1 8½	—	—	1	—
1902	"	—	—	3	1 8	—	—	—	1 2½
1903	"	1	0 13½	1	1 1½	—	—	1	0 13
1904	"	1	1 13	2	1 1	1	1 7½	—	—
1905	"	3	1 1	2	1 5	—	—	1	0 12
1906	"	7	1 0	—	—	2	0 14½	—	—
1907	"	5	1 4	—	—	4	1 1½	—	—
1908	"	1	1 2½	—	—	—	—	1	1 1
1909	"	1	1 12	1	1 2½	1	1 6½	1	0 12½
1910	"	2	1 3½	1	1 9½	—	—	1	1 2½
1911	"	—	—	1	0 15	—	—	—	—
1912	"	1	1 0	—	—	—	—	—	—
1913	"	—	—	—	—	—	—	—	—
1908	Ayrshires	—	—	—	—	—	—	1	0 12
1909	"	—	—	—	—	—	—	—	—
1910	"	—	—	1	1 15	—	—	—	—
1911	"	—	—	—	—	—	—	—	—
1912	"	2	1 4½	2	1 0½	—	—	—	—
1913	"	—	—	—	—	—	—	—	—
1909	South Devons	1	2 5½	1	1 1½	—	—	2	1 11½
1910	"	1	2 5½	4	1 11½	1	2 0	1	0 12½
1911	"	—	—	—	—	—	—	2	1 5
1912	"	2	2 0½	—	—	1	2 3½	1	1 10½
1913	"	1	2 3½	1	0 13	—	—	—	—
1914	"	3	2 1	1	1 15	1	1 4½	1	1 2½
1908	Kerries & Dexters	—	—	—	—	1	0 14	2	1 2
1909	"	1	1 5	—	—	1	1 7	—	—
1910	"	—	—	—	—	—	—	—	—
1911	"	—	—	—	—	—	—	1	1 3½
1912	"	—	—	—	—	—	—	—	—
1913	"	4	1 4½	1	0 13½	—	—	—	—
1914	Holsteins	—	—	—	—	1	1 3½	—	—

TABLE IV.—COMPARISONS OF CHURNINGS WITH ANALYSES.  
SHORTHORNS.

No. in Catalogue	Weight of Butter Churned		Total Fat by Analyses		No. in Catalogue	Weight of Butter Churned		Total Fat by Analyses	
	lbs.	ozs.	lbs.	ozs.		lbs.	ozs.	lbs.	ozs.
2	2	6½	2	3	35	0	15½	0	14
3	1	1½	1	9	43	1	12½	2	5
6	1	9½	1	13½	48	2	2½	2	4
8	1	11½	1	8½	55	1	15½	2	4
9	1	1½	1	9	56	2	15½	2	15½
10	1	13½	1	12	59	2	3½	2	4
13	3	0	2	15½	61	1	11½	1	10½
14	2	1	2	5½	65	2	3½	2	1
15	1	2½	1	8½	66	2	1½	2	4
28	0	12	0	12½	68	1	11	2	4
					36		14	39	2½

## LINCOLN RED SHORTHORNS.

84	1	11½	1	13	87	1	6½	1	7½
85	1	12	1	10	90	1	9½	1	9½
					6		7	6	7½

## JERSEYS.

101	1	10	1	9	110	2	6½	2	0½
102	2	1½	1	15	111	2	5½	2	3
103	1	8	1	6	112	2	5	2	3
105	1	15½	1	12½	113	1	9½	1	10½
106	1	10	1	7½	17		7	16	2½

## GUERNSEYS.

132	1	3½	1	7½	140	1	1½	Heifer	
135	1	6½	1	10	141	1	0	Heifer	
137	2	6	2	3	4		15½	5	4½

## SOUTH DEVONS.

158	2	5	2	5½	163	1	15	1	15½
159	2	0½	2	2	164	1	2½	1	7
161	1	13½	1	11½	165	1	4½	1	7
					10		8½	11	0½

## HOLSTEINS.

168	1	3½	1	11½	—	—	—	—	—
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TABLE V.—AVERAGE DIFFERENCES BETWEEN CHURNINGS AND CHEMICAL ANALYSES FROM 1898 TO 1914 INCLUSIVE.

Year	Breed	Churn	Analyses
		Lbs. Butter	Lbs. Fat
1898	Shorthorns ... ..	38.92	36.82
1899	" ... ..	34.34	32.46
1900	" ... ..	35.55	37.87
1901	" ... ..	29.05	27.80
1902	" ... ..	53.48	55.91
1903	" ... ..	30.72	35.92
1904	" ... ..	22.98	26.59
1905	" ... ..	30.89	30.58
1906	" ... ..	31.38	33.59
1907	" ... ..	45.14	47.79
1908	" ... ..	43.74	49.78
1909	" ... ..	35.06	35.91
1910	" ... ..	41.62	44.75
1911	" ... ..	47.79	48.00
1912	" ... ..	61.10	63.85
1913	" ... ..	43.01	48.69
1914	" ... ..	36.87	39.14
1907	Lincolnshire Red Shorthorns ...	12.94	12.31
1908	" " " ...	15.79	15.56
1909	" " " ...	14.06	13.48
1910	" " " ...	13.37	13.62
1911	" " " ...	10.16	10.00
1912	" " " ...	11.47	12.00
1913	" " " ...	9.12	8.65
1914	" " " ...	6.44	6.47
1898	Jerseys ... ..	29.15	27.26
1899	" ... ..	23.61	22.54
1900	" ... ..	39.75	39.32
1901	" ... ..	33.19	31.82
1902	" ... ..	43.61	41.03
1903	" ... ..	27.04	26.41
1904	" ... ..	22.22	22.06
1905	" ... ..	24.53	22.44
1906	" ... ..	19.56	18.71
1907	" ... ..	22.64	—
1908	" ... ..	22.25	—
1909	" ... ..	37.65	35.89
1910	" ... ..	*30.37	30.18
1911	" ... ..	27.62	26.18
1912	" ... ..	14.39	13.39
1913	" ... ..	29.54	†20.90
1914	" ... ..	17.44	16.14
1898	Guernseys ... ..	18.07	8.25
1899	" ... ..	15.90	5.53
1900	" ... ..	0.84	11.10
1901	" ... ..	2.46	11.59
1902	" ... ..	1.23	1.34
1903	" ... ..	5.34	0.47
1904	" ... ..	4.89	4.94
1905	" ... ..	3.42	3.42

\* Excluding Nos. 142 and 146.

† Does not include the fat of Jersey Heifers competing in the Tests.

TABLE V.—AVERAGE DIFFERENCES BETWEEN CHURNINGS AND  
CHEMICAL ANALYSES FROM 1898 TO 1914 INCLUSIVE—*Continued.*

Year	Breed	Churn	Analyses
		Lbs. Butter	Lbs. Fat
1906	Guernseys ... ..	2.41	1.82
1907	" ... ..	3.54	3.22
1908	" ... ..	3.69	3.52
1909	" ... ..	3.20	3.52
1910	" ... ..	2.44	2.81
1911	" ... ..	.87	1.5
1912	" ... ..	2.31	2.96
1913	" ... ..	†8.48	7.59
1914	" ... ..	†4.96	5.28
1898	Red Polls ... ..	5.04	5.56
1899	" ... ..	8.48	8.33
1900	" ... ..	8.98	9.81
1901	" ... ..	3.07	2.88
1902	" ... ..	8.36	8.00
1903	" ... ..	5.01	6.95
1904	" ... ..	5.39	6.00
1905	" ... ..	13.42	14.53
1906	" ... ..	11.39	14.50
1907	" ... ..	12.53	16.08
1908	" ... ..	3.21	4.06
1909	" ... ..	5.09	5.71
1910	" ... ..	5.12	6.25
1911	" ... ..	.94	1.08
1912	" ... ..	1.0	1.31
1910	Ayrshires ... ..	1.94	1.75
1912	" ... ..	5.37	5.89
1909	South Devons ... ..	6.89	7.03
1910	" ... ..	12.03	13.06
1911	" ... ..	2.64	3.25
1912	" ... ..	7.92	8.39
1913	" ... ..	3.01	3.75
1914	" ... ..	10.50	11.00
1907	Kerries ... ..	3.40	3.19
1908	Kerries and Dexters ... ..	6.89	7.09
1909	Kerries ... ..	2.75	2.64
1911	" ... ..	1.21	.96
1913	" ... ..	5.94	6.10
1914	Holsteins ... ..	1.2	1.69

† Does not include the fat of Guernsey Heifers competing in the Tests.

BUTTER TESTS—SHORTHORNS.

No. in Catalogue	Exhibitor and Name of Cow.	Date of Birth	Date of last Calf	No. of Days in milk			Milk Yield		Butter Yield	Ratio, viz. lbs. milk to lbs. butter	Colour and Quality of Butter		No. of Points for butter	No. of Points for Lactation	Total number of Points	Awards.
				Morn.	Even.	Total	lbs. ozs.	lbs. ozs.			Colour	Quality				
				1914												
2	Samuel Sanday's Janetia ...	Dec. 19, 1907	Sept. 18	33	26	8 18	2 44	10 2	6½	18 66	Good	Fair	38 25	—	38 25	3rd Prize
3	Samuel Sanday's Duke's Daisy 2nd ...	Feb. 3, 1906	June 17	126	25	2 22	10 47	12 1	1½	43 04	Good	Poor	17 75	8 60	26 35	
6	H. Fitzherbert Wright's Red Rose A 2nd ...	Feb. 27, 1907	Sept. 18	33	27	3 24	0 51	3 1	9½	32 11	Good	Poor	25 50	—	25 50	
8	F. H. D. C. Whitmore's Primrose ...	Jan. 29, 1910	Sept. 1	50	23	10 24	5 47	15 1	11½	27 64	Good	Fair	27 75	1 00	28 75	
9	H. H. Owtram's Newland Poppy 3rd ...	Feb. 13, 1905	Sept. 27	24	24	8 20	8 45	0 1	1½	41 14	Good	Poor	17 50	—	17 50	
10	F. H. Thornton's Somerford Flower 2nd ...	Feb. 2, 1909	June 29	114	23	2 22	14 46	0 1	13½	24 73	Good	Poor	29 75	7 40	37 15	4th Prize
13	J. Moffat's Daisy Bella 9th ...	Mar. 2, 1907	Oct. 1	20	29	10 25	11 55	5 3	0	18 44	V. Gd.	Ex.	48 00	—	48 00	1st Prize, Silver Medal and Nelson Cup
14	R. W. Hobbs & Sons' Rose 44	Nov. 17, 1907	Sept. 13	38	40	5 32	11 73	0 2	1	35 39	Pale	Greasy	33 00	—	33 00	
15	R. W. Hobbs & Sons' Melody 13	Mar. 11, 1909	Sept. 1	50	27	14 25	3 53	1 1	7½	36 13	Pale	Poor	23 50	1 00	24 50	
23	H. Fitzherbert Wright's Darlingford Cranford 80	Dec. 9, 1911	Aug. 15	67	13	3 12	0 25	3 0	12	33 58	Good	Fair	12 00	2 70	14 70	
35	J. FitzHugh's Lady York	Jan. 22, 1912	Sept. 14	37	15	0 13	14 28	14 0	13½	29 33	Pale	Poor	15 75	—	15 75	
43	A. Stansfield's Lady Cragg Vale	4 yrs., 7 mos.	Oct. 2	19	26	0 27	0 53	0 1	12½	22 50	Good	Fair	28 75	—	28 75	
48	G. B. Nelson & Son's Bertha	—	Oct. 1	20	28	2 25	2 53	4 2	2½	24 70	Good	Good	34 50	—	34 50	H.C.
55	S. S. Raingill's Ruby	—	Sept. 19	32	31	5 28	13 60	2 1	15½	30 30	Pale	Poor	31 75	—	31 75	

## BUTTER TESTS—SHORTHORNS—Continued.

No. in Catalogue	Exhibitor and Name of Cow	Date of Birth	Date of last Calf	No. of days in milk	Milk Yield.			Butter Yield	Ratio, 1 lb. milk to 1 lb. butter	Colour and Quality of Butter		No. of Points for butter	No. of Points for Lactation	Total number of Points	Awards
					Morn.	Even.	Total			Colour	Quality				
					lbs. ozs.	lbs. ozs.	lbs. ozs.								
56	S. S. Raingill's Liberty ...	6 years	1914 Sept. 20	31	30	11	28	238	132	15½	19-91	Good	Oily	47 25	2nd Prize and Bronze Medal
59	J. W. Astley's Southfield Edna	—	Sept. 20	31	35	11	39	666	12	3½	29-77	Good	Greasy	35-50	H.C.
61	A. Andrew's Snowball ...	Jan. 19, 1908	Oct. 1	20	24	0	17	841	81	11½	23-92	Ex.	Good	27-75	H.C.
65	J. L. Shirley's Silverton Dahlia	7 years	Oct. 1	20	36	8	30	686	142	3½	30-35	Good	Good	35-25	H.C.
66	F. B. Wilkinson's Sherwood Rose 2nd	—	Oct. 5	16	30	6	25	1356	32	1½	26-84	Good	Good	33-50	
68	Extra. of late F. J. Stanhope's Ruby	5 yrs.	Sept. 30	21	24	0	20	644	61	11	30-90	Pale	Good	27-00	
84	S. Blundell's Bendish Charm	June, 1909	Sept. 22	29	30	10	27	257	121	11½	33-90	Pale	Poor	27-25	
85	C. E. Scorer's Bracebridge Burton	March, 1905	July 18	95	23	6	19	842	141	12	24-50	Good	Good	28-00	5-50
87	John Evens' Burton Pride 12	Sept. 24, 1910	Sept. 1	50	25	6	23	848	141	6½	34-76	Good	Good	22-50	1-00
93	John Evens' Burton Amy 4 ...	April 28, 1911	Sept. 14	24	24	5	20	1145	01	9½	28-51	Good	Good	25-25	—

## BUTTER TESTS—SHORTHORNS—Continued.

No. in Catalogue.	Name of Cow	CHURNING—TIME AND TEMPERATURE.				
		Time		Temperature		
		Churning began	Churning finished	Duration of Churning	Dairy	Cream and Churn
				Minutes	Degrees	Degrees
2	Janetia	9 8 a.m.	9 22 a.m.	14	63	52
3	Duke's Daisy 2nd	9 0 "	9 35 "	35	63	52
6	Red Rose A 2nd	9 0 "	9 40 "	40	63	52
8	Primrose	9 5 "	9 30 "	25	63	52
9	Newland Poppy 3rd	9 10 "	9 35 "	25	63	52
10	Somerford Flower 2nd	9 6 "	9 50 "	44	63	52
13	Daisy Bella 9th	9 47 "	10 15 "	28	63	52
14	Rose 44	9 55 "	10 30 "	35	64	52
15	Melody 13	9 45 "	10 20 "	35	63	52
28	Darlington Cranford 80	9 30 "	10 0 "	30	63	52
35	Lady York	10 0 "	10 30 "	30	64	52
43	Lady Cragg Vale	9 50 "	10 10 "	20	64	52
48	Bertha	10 4 "	10 25 "	21	64	52
55	Ruby	11 25 "	11 45 "	20	66	52
56	Liberty	10 20 "	10 40 "	20	65	52
59	Southfield Edna	10 30 "	10 50 "	20	64	52
61	Snowball	10 35 "	10 57 "	22	64	52
65	Silverton Dahlia	10 42 "	11 8 "	26	64	52
66	Sherwood Rose 2nd	11 20 "	11 40 "	20	64	52
68	Ruby	11 25 "	11 47 "	22	66	52
84	Bendish Charm	11 30 "	11 50 "	20	66	52
85	Bracebridge Burton	11 35 "	11 54 "	19	66	52
87	Burton Pride 12	11 40 "	12 34 "	54	66	52
90	Burton Amy 4	11 55 "	12 40 "	45	66	52
						58

## BUTTER TESTS—JERSEYS.

No. in Catalogue	Exhibitor and Name of Cow	Date of Birth	Date of last Calf	No. of Days in milk		Milk yield in 24 hrs.	Butter Yield	Ratio, viz., lbs. milk to lbs. butter.	Colour and Quality of Butter		No. of Points for butter	No. of Points for period of Lactation	Total number of Points	Awards
				1914	lbs ozs lbs ozs				Colour	Quality				
101	J. Carson's Pamela 2nd ... ..	Jan. 26, 1909	Mar. 25	210 29	10 1	10	18 23	Pale	V.Gd.	26 00	12 00	38 00	Certificate of Merit	
102	J. Carson's Vigilance ... ..	July 3, 1908	Aug. 7	75 48	6 2	14	23 10	Pale	V.Gd.	33 50	3 50	37 00	Certificate of Merit	
103	J. Carson's Queen of Trumps ...	April 12, 1909	Sept. 12	39 29	10 1	8	19 75	Pale	V.Gd.	24 00	Nil.	24 00	—	
105	Miss Enderby's Favour's Fortune	May 8, 1908	April 8	196 34	2 1	154	17 47	Pale	V.Gd.	31 25	12 00	43 25	Certificate of Merit	
106	Miss Enderby's Beckington Helen	July 31, 1910	June 10	133 32	2 1	10	19 76	Good	V.Gd.	26 00	9 30	35 30	Certificate of Merit	
110	J. H. Smith-Barry's Marionette ...	Oct. 3, 1904	May 17	157 42	2 2	64	17 62	V.Gd.	Ex.	38 25	11 70	49 95	Gold Medal.	
111	J. H. Smith-Barry's Duckwing ...	Aug. 30, 1910	June 1	142 37	0 2	54	15 78	Good	Ex.	37 50	10 20	47 70	Bronze Medal.	
112	J. H. Smith-Barry's Heywood Bluebell	Mar. 16, 1906	May 20	154 41	8 2	5	17 93	Good	V.Gd.	37 00	11 40	48 40	Silver Medal.	
113	J. H. Smith-Barry's Last of the Lilies	Mar. 2, 1911	April 27	177 32	14 1	94	20 62	Very Good		25 50	12 00	37 50	Certificate of Merit	



## BUTTER TESTS—JERSEYS—Continued.

No. in Catalogue	Name of Cow	CHURNING—TIME AND TEMPERATURE.					
		Time		Temperature			
		Churning began	Churning finished	Duration of Churning	Dairy	Cream and Churn	Buttermilk, when churn- ing finished
				Minutes	Degrees	Degrees	Degrees
101	Pamela 2nd...	9 45 a.m.	10 18 a.m.	33	60	52	54
102	Vigilance ...	9 46 "	10 14 "	28	60	52	54
103	Queen of Trumps ...	9 42 "	10 27 "	45	59	52	55
105	Favour's Fortune ...	9 40 "	10 25 "	45	59	52	55
106	Beckington Helen ...	10 28 "	11 30 "	62	60	52	56
110	Marionette ...	10 37 "	12 18 p.m.	101	61	52	63
111	Duckwing ...	11 50 "	12 56 "	66	63	52	62
112	Heywood Bluebell ...	10 52 "	11 55 "	63	62	52	57
113	Last of the Lilies ...	10 46 "	11 40 "	54	62	52	57



## BUTTER TESTS—OTHER BREEDS.

No. in Catalogue	Name of Cow	CHURNING—TIME AND TEMPERATURE.				Temperature	
		Time		Duration of Churning	Dairy	Cream and Churn	Buttermilk, when churning finished
		Churning began	Churning finished				
				Minutes	Degrees	Degrees	Degrees
132	Treacle ... ..	12 15 p.m.	12 45 p.m.	30	66	52	56
135	Goldstream 5th ... ..	12 5 "	12 40 "	35	66	52	57
137	Merton Dairymaid 5th ... ..	12 22 "	1 10 "	48	66	52	57
140	Gilin of Blunham ... ..	12 55 "	1 25 "	30	66	52	57
141	Dunnington Marigold 2nd ... ..	12 50 "	1 20 "	30	66	52	56
158	Hilda 3rd ... ..	1 25 "	2 35 "	70	66	52	57
159	Cherry 5th... ..	1 0 "	1 30 "	30	66	52	57
161	Princess 4th ... ..	12 45 "	1 5 "	20	66	52	57
163	Mayflower 28th ... ..	12 50 "	1 27 "	37	66	52	57
164	Golden Cup ... ..	12 42 "	1 20 "	38	66	52	57
165	Carnation ... ..	12 37 "	1 45 "	68	66	52	55
168	Gorstage Goudsteen ... ..	11 55 "	12 30 "	35	66	52	57

## THE POULTRY SECTION.

By L. C. VERREY, The Warren, Oxshott, Surrey.

THE Thirty-ninth Annual Show, which opened on Tuesday, October 20th, may be chronicled as a huge success despite the fears that were entertained that the International crisis might have the contrary effect. Though the total entry in the Poultry section did not reach the record of the previous year, which could hardly be expected in quite normal circumstances, yet the 3,089 exhibits compare very favourably with several former shows during the last decade, and the general opinion was that the quality, as a whole, was much above the average.

Our section, as usual, opened with the Table Poultry and Rabbits, which made a very interesting display in one corner of the Gilbey Hall. Naturally, the object of the Committee is to encourage the breeding of poultry suitable for table, and to stimulate the best methods of fattening and preparing for the table. The judge in his report remarks: "This show had much to recommend it, not only from an educational point of view, but as a great object lesson. It is true utility poultry keepers do not sufficiently recognise the importance of cross-bred poultry, especially birds of a first cross, which the laws of prolificacy prove to give the very best results in hardy stock and of rapid growth. I would in this connection strongly recommend the Dorking or Indian Game crossed with Lincolnshire Buffs, Plymouth Rocks, Sussex, and Faverolles, all of which produce magnificent table chickens."

Class 1 for Couple of Orpington Cockerels, 10 pairs were staged, the First prize falling to a very well-shaped and meaty couple. The next class for a Couple of Pullets contained exactly the same number of exhibits. Class 3 contained no less than 22 couples of Sussex Cockerels. The First and Second prizes and Silver Medal were all gained by the same exhibitor with well-fatted, meaty birds. Of Couples of Sussex Pullets there were only 11. The two classes for Any Other Pure Variety were but poorly filled, as there were only 13 entries between the two; on the other hand, Cross-breeds came up fairly strongly, but still not so well as on several previous occasions. In the class for Indian Game, or Game crossed with any other Pure Breed, a truly magnificent pair of well-fatted Game-Dorking rightly won, this exhibit also being awarded the Poulterers Company's Champion Gold Medal and two Silver Medals, and made no less than £4 15s. at the auction. The same exhibitor also gained Second and Third in the same class. Couples of Pullets of the same cross numbered 18. The winning pair were very nice, being well developed and particularly

meaty, so that it was not surprising they captured the Poulterers Company's Silver Medal. Class 9 for Couples of Cockerels of any other cross contained only five exhibits; whilst in the next class there were but seven pairs of pullets. Waterfowl were small in quantity, but large in quality, especially the winning gosling, which was extremely fine and well fattened. The Special class for Two Cockerels brought together 23 entries, Game-Faverolles of capital quality leading and also taking the Poulterers Company's Bronze Medal, were certainly a very nice pair. The following class for Couples of Pullets contained 27, and amongst them were some very good birds. The Weight Limit class for Ducks or Drakes was not the success it ought to have been with only six entries. Rabbits had only one class, as the other had to be cancelled for lack of entries, and in that one only eight couples competed.

The auction sale of the Table Poultry was very successful, the one exhibit I have referred to fetching the high price of £4 15s.; whilst every exhibit sold brought prices much in advance of market values. Two classes for New Laid Hen's Eggs, in packages of 12, were instituted for the first time in this section, and 28 entries were made, but unfortunately many were absent, in fact, in one class the judge withheld the Third prize on account of insufficient merit. It is to be regretted that in so many instances the eggs were not well or carefully packed and in consequence large numbers got damaged in transit. It would perhaps be an advantage another year to state that the packing and package itself would be taken into consideration by the judge.

The Live Poultry section of the catalogue opened with that purely old British fowl, the Dorking, of which there were no less than 51 divided amongst the four classes of standard table fowls. The First Dark cockerel was awarded the Medal for the best Dorking, and well he deserved it, as he was a typical specimen of the breed. The winning pullet and the First Silver-grey cockerel were indeed good birds. The judge considered the quality all through so satisfactory that he felt it necessary to bestow more than the ordinary number of cards.

Modern Langshans at one time were very numerous at the "Dairy," especially when only the Black variety were catered for, but now they have dwindled down to 19 in the two classes, and of Blues only 13 faced the judge. Croad Langshans mustered more strongly, as 15 cockerels and 23 pullets were penned; the cockerel gaining the Medal. It is very evident that the Croads are coming more and more to the front, their shorter length of leg finding greater favour with the majority of poultry keepers, and thus giving the body a more compact appearance.

The four classes of Brahmas were fairly well filled and some of the specimens were excellent examples of the breed, especially the Light cockerels, as several of the Darks were not at their best. The Silver Medal being awarded to the first Light cockerel, a very forward and well-furnished bird. Cochins this year had to be content with only

two classes, a fact that could hardly be wondered at considering that in former years the four classes had been so poorly supported. Taking into consideration that Cochins are not very rapid in developing or in feathering, still a cockerel class of only five entries and a pullet class of only nine is not a good representation of a once very noted breed at a classic show; still though the quantity was absent the quality was all there, the winning cockerel being heavily feathered, with rich colour, and very typical in shape; a very smart White coming second, and a nicely-feathered, sound-coloured Buff third. In the pullet class, the colours of the winners were reversed, a very level-coloured Buff leading, and though somewhat juvenile, should develop into a grand hen. The second was a nicely-feathered Black; whilst a good White took the third place. Sussex, indeed, made a good display of 132 birds in eight classes, of which the light pullets (28) and the speckled pullets (23) formed the largest. The competition all through was very keen, so that it was no easy matter for the judge to pick out the winners. Undoubtedly the Sussex is a very useful fowl for anyone to keep who requires a good all-round breed which in itself is an excellent table bird and also most useful for crossing purposes. Naturally the brown variety made the smallest of the classes, the light and speckled being the more popular, but taking them as a whole, they were a very level lot all through. Houdans were far below their usual numbers, there being only six cockerels and seven pullets. The former were a very moderate lot, but the latter better, the Medal-winning pullet being a most typical specimen indeed. Faverolles were all of the highest quality, the four classes containing 50 birds, and the Silver Medal went to the winning Salmon cockerel—a real good one. The White variety seems to be greatly improving, and it is surprising that their unique appearance does not captivate more breeders. Malines had two classes, but probably owing to the war, they only contained a dozen birds between them. The First prize cockerel, a Coucou, was a very large fellow of nice quality. Malines are a breed well worth cultivating, as they are most excellent table birds. Of Campines there were 52 all told, of which 22 were Silver pullets; but the best of the whole lot was found in the first Gold pullet.

Wyandottes, as usual, made a capital collection of 249 birds. Both the silver-laced and the gold-laced varieties made good classes, the quality being of high merit. The first Silver cockerel was large in size and especially well laced. The Medal for the best Wyandotte being awarded to him. Whites were particularly numerous, there being 31 cockerels and 36 pullets. The leader in this class not only captured the Special prize for the best White Wyandotte, but was subsequently awarded the Champion Cup for the best pullet in the show. She was a marvel for symmetrical proportion, type, and purity of colour. The majority of the others were of good quality and type. Blacks were much smaller classes and the quality moderate, many specimens failing in leg and type. Columbians numbered 13 cockerels and 14 pullets. Taken altogether, these birds were not so good as in the previous year, the purity of colour being the prevailing fault, and

it would appear that breeders of this variety will have to pay more attention to this. Partridge Wyandottes formed two moderately filled classes, the cockerels excelling the pullets in quality. Buffs again were disappointing in numbers, but like many breeds of this colour they do not seem to particularly take the public fancy. Spangles and Any Other Colour were just fair average classes, but amongst the latter Blues predominated.

Orpingtons, despite three classes being cancelled, came up very well with 282 entries, and though none of the classes which remained came up to the average size of last year, yet 32 Black pullets, 33 White pullets, 35 Buff pullets, and 47 Blue pullets formed no mean lots. The Silver Medal was awarded to the winning Buff cockerel, which excelled in type and evenness of colour. Rarely has a better bird of this variety been seen at the Dairy Show. The comparatively modern colour Blue was a very vast improvement on the previous year, uniformity of type and colour being very noticeable. Rhode Island Reds made a splendid display of single combs, whilst the Rose-combs were only moderate in numbers. Of single combs there were 40 cockerels and 43 pullets, but want of lustre seemed the prevailing fault all through. Evidently judging by the quantity of single combs, their qualities are appreciated by the many. Ancona pullets were strong, but cockerels weak. Hamburgs, as at several previous shows, made only moderate classes, that for pullets of any other colour being the largest with 14 entries.

Old English Game were considerably down in numbers this year, and three classes were obliged to be cancelled for lack of entries. A well-made Black-red cockerel of good colour captured the Association's Silver Medal. Minorcas also suffered a diminished entry, and the quality (excepting the winners) was not equal to what has been seen at the Dairy Show. Andalusians are certainly looking up with 17 pullets and a dozen cockerels. The Silver Medal went to a well-laced and developed cockerel. This is a breed worth cultivating, as the hens are well noted for egg production. Leghorns followed next, and though there were less entries than the previous year, they formed a very attractive collection, and special notice can be made of the Browns and Whites, which were excellent. The minor varieties were decidedly poor in numbers, though good in quality. It is to be regretted that the higher cultivation of Leghorns, with a view to comply with the standard requirements, is evidently deterring many fanciers from continuing their breeding, which is a great pity, as originally their merits as egg producers were very high. Black Rose-comb Leghorns made two fairly even classes, and generally the quality of both sexes was an advance, though there is still room for improvement as to uniformity in size of comb. For the first time at the Dairy Show a separate classification was made for Sicilian Buttercups, and the two classes nicely filled with 16 cockerels and 23 pullets. The judge in reporting on this breed, said: "The quality over all is excellent, a great advance on last year's show, there being an entire absence of culls or off-coloured birds, showing that breeders have now studied

the standard requirements. In regard to the cockerels surface colour was good, there being little surface black and no white apparent. Excessive white in lobe is current in both sexes. Several cockerels failed in type and that alert carriage which should distinguish this breed." It appears as though there was a very bright future before Sicilian Buttercups as they are being more largely bred each year.

Plymouth Rocks are always well supported, and though the Barreds were not quite so strong in numbers as have been on view at the Agricultural Hall, yet the two dozen cockerels and the 17 pullets made no mean display. The Silver Medal for the best Plymouth Rock was awarded to the winning Barred pullet, a bird of extra good size and shape with most beautiful marking. The Buff and the White Rocks formed only small classes, but there were some extra good birds amongst them. In the Any Other Colour Rock classes there were 12 cockerels, but only five pullets. Amongst the cockerels was found a novelty in the shape of Golden Barreds, one of which carried off the First prize. This new sub-variety is certainly very pleasing to the eye and should prove a valuable adjunct to the Rock family. Scots Dumpies were another innovation at our show, and the one class for cockerel or pullet brought 12 entries. Silkies do not seem to increase in public favour, for in the three classes there were only 16 entries, and these 16 birds were shown by five exhibitors.

Indian Game made nearly, if not quite, a record entry, with 26 cockerels and the same number of pullets in the two classes, the quality being of superior order. Malays were not up to the mark for quantity, and one class had to be cancelled for lack of entries.

Among the Any Other Distinct Variety of large fowls were to be found Brown-red Modern Game, Crève-Cœurs, Black Spanish, Russian Orloffs, Silkie Blue Orpingtons, &c., so that the novice had a capital opportunity of comparing the points of these several breeds and noting their distinguishing features.

The Breeding pens have always created the greatest interest amongst exhibitors and visitors, and this year proved no exception to the rule, as the pens were crowded round with spectators from the opening to the close of the show. Unfortunately, the class for feather-legged breeds had to be cancelled, but in the two remaining classes there were 31 pens or 124 birds. Of course, the class for Plymouth Rocks, Orpingtons, or Wyandottes only contained quartets of these breeds, but in the next were to be found Brown-red Game, Crève-Cœurs, Dorkings, Light Sussex, Indian Game, Rhode Island Whites, Rhode Island Reds, Houdans, White, Black and Exchequer Leghorns. White Wyandottes secured the Trophy and the Silver Medal.

All the Selling classes filled exceedingly well, many of the exhibits being excellent, and were disposed of at the auction at figures considerably in advance of catalogue price.

#### WATERFOWL AND TURKEYS.

The Waterfowl were quite up to the average for quality, and taken altogether they formed a nice show. The older breeds, such



as Aylesburys and Rouens, seem to be displaced in public favour, judging by the smaller number of entries, compared with the more modern varieties of Indian Runners, Buff and Blue Orpingtons, the former having 43 entries and the latter 34; whilst of Aylesburys there were but 16, and 18 Rouens. At one time these two breeds were held in the highest estimation; then very large classes of both were seen at Islington. Pekins were also once great favourites, but this time both classes for them suffered cancellation for want of entries. The Any Other Variety classes were mostly filled with Cayugas and Blue Forests. The same noticeable paucity of Rouens prevailed in the Selling class section, whilst the Runners and Orpingtons were quite numerous.

Geese were decidedly good, there being 19 Toulouse and 21 Embdens, the Medal going to a very fine specimen of the former variety.

Turkeys were a fine lot of 70 choice specimens, the Bronze variety being particularly strong; whilst the Whites were no mean collection. Both the Medal winners were splendid birds. It may be mentioned that several birds of both breeds were claimed at catalogue prices.

#### BANTAMS.

The 477 pairs of Bantams were all staged in the Berners Hall, and a very pretty display they made, creating much interest among the visitors, especially the breeding pens. The section opened with Breeding pens for Game, of which there were six entries, and as there were four birds in each pen, there were 24 splendid little beauties on view. Very stylish Duckwings won, followed by Piles Second, and Black-reds Third. The next class was for Black-red cocks or cockerels, of which there were just a dozen, the First Prize winner being a very small and tight-feathered little fellow, who also captured the Medal for the best Game Bantam, and was subsequently awarded the 10-guinea Cup for the best cockerel in the show, an award which seemed to give general satisfaction. The Pile Game formed particularly strong classes with 23 cockerels and 22 pullets. Old English Game Bantams were especially meritorious, the Spangleds being excellent, a charming little hen winning the Silver Medal. Malays formed only small classes, whilst those for Yokohamas had to be cancelled. The Bantams not Game were excellent throughout, and the competition in many classes very keen. Of Breeding pens there were eight, and the variety of breeds was charming. Minute White Frizzles were selected as the winners of First Prize, Indians Second, and Black Pekins Third; a nice lot of little Barbu d'Anvers were very highly commended. Black Rose-combs were particularly strong, both in quantity as well as quality, and seldom has a better lot been seen. The Sebrights were a splendid lot, in fact many thought them the best classes in the whole show. The First Prize Silver pullet taking the Association's Silver Medal for the Best Variety Bantam, hen or pullet; she was wonderfully laced all through. The Polish were a good lot, these quaint-looking little birds

attracting a great deal of attention. Despite all the terrible trouble in Belgium, the class for Barbu d'Anvers was nicely filled with these pretty little mites. The Bantam selling classes were both large, and several exhibits were claimed.

As previously mentioned, the Black-red Game Bantam was awarded the Champion Cup for the best cockerel in the show. The Champion Cup for the best pullet going to the First Prize White Wyandotte.

Taking all things into consideration, the British Dairy Farmers' Association, the exhibitors, and all concerned may congratulate themselves on the success of the Poultry department of the Dairy Show of 1914, and the innovation of having the award boards fixed at the foot of the staircase during the morning of the first day.

## THE PIGEON SECTION.

By JOHN H. ROSS, 130, Ferme Park Road, Stroud Green, London, N.

ONCE again I have the privilege of reporting on the Pigeon Section of the Dairy Show, and to record with pleasure the continued popularity of the section both with the fancy and the general public. The exhibits for 1914 reached the number of 2,289, being only 178 fewer than in the previous year, despite the unsettling influences due to the war. The attendance was quite as satisfactory as could be reasonably expected in the present crisis.

Public attention has lately been greatly directed towards Homers in connection with the war, the Government having employed them since November last, and forbidden the liberation of unauthorised birds. His Majesty the King, patron of the Show, and President of the National Flying Club, honoured the Association by exhibiting a pair of Working Homers, which won a v.h.c. and h.c. respectively. It is pleasing to note that the judging for the two principal prizes was in the able hands of Mr. S. Palgrave Page, past-President of the Association and present Chairman of the Finance Committee, who consented to act in that capacity by the unanimous wish of the Committee, and in which he gave the greatest possible satisfaction.

Details of the various classes are given below.

*Fantails* led with eight classes, numbering 100 pens, as against 107 pens in seven classes last year. The quality and condition of the birds excelled in many respects previous shows, the exhibits throughout being so good. Pen 3158 (George E. Gray), a beautiful Black, won First, Champion Cup, the Silver Medal of the Association, and was also Reserve for the Gold Medal for pigeons of any age. The Whites were also a grand collection and the Silvers equally good. They have much improved in the past season and, taken altogether, were a splendid exhibit.

*Pouters* provided a very poor display indeed, 11 pens only in two classes. The quality of the few was good, especially Pens 3192 and 3197 (J. W. Craig), but I am at a loss to understand why Bonnie Scotland does not patronise the Dairy Show now as it did years ago.

*Pigmy Pouters* made a very grand collection, numbering 140 pens in 13 classes as against 125 pens in 1913. This very charming variety continues to attract the notice of the public, and well they may from their very pleasing and friendly behaviour. To Pen 3293, a Red cock (McLelland & Johnstone), was awarded First and the Medal of the Association. It was also Reserve for the Esquilant Trophy. The quality was grand throughout, not an indifferent bird in the whole collection; in fact, the best lot the Dairy Show has ever had.

*Norwich Croppers* do not appear to increase in numbers, but the quality is well maintained. They mustered 42 pens in four classes with scarcely a bird without a notice. To Pen 3359 (E. Foster), a grand Black, was awarded 1st and the Esquilant Trophy, the first time, I think, that a Cropper has won such an award at the Dairy; but his style and condition carried all before him and it was a most popular win.

*Carriers* numbered 75 in eight classes, being only 18 in excess of last year—very disappointing, I think. The quality of the exhibits was good, taken altogether. Pen 3386, a Dun cock (F. Meyer), was awarded First and the Gold Medal of the Association—a grand bird. The Association's Silver Medal was awarded to Pen 3427 (G. & J. Smith), also a Dun cock. Although the birds were good I do not consider that they are equal to those exhibited some years ago.

*Barbs* had five classes provided and numbered 30, being seven more than last year. The quality was good, but some of them were not in the best of condition as regards plumage. The Silver Medal of the Association was awarded to Pen 3468 (W. S. Brocklehurst) with a good Dun hen. There were other notable birds in the same variety.

*Dragoons*, as is usual at the Dairy, made a grand display, and numbered 344 pens in 32 classes, but fell short of the numbers of 1913 by 21. This was, no doubt, owing to the two Grizzle classes (318 and 323) being cancelled. The Blues have not as yet, I think, arrived at their standard of some years ago. The Chequers continue to retain their standard for cobbliness and shortness of feather. The Grizzle classes 329 and 333 were not equal in quality to those of last year, with a few exceptions. The Silvers were a very nice collection and some excellent birds amongst them, but I do not think that, as a whole, they are up to the standard I have seen here. Yellows and Reds continue excellent both in colour and type, and the Whites were a nice lot, exceptionally good in texture of wattle and eye cere. The principal awards were Pen 3766 (Burton & Holder) with a Chequer hen, winning First and Cup and the Association's Silver Medal, also the Fulton Trophy; Pen 3698 (C. W. Patterson), First, Cup and Medal, a Grizzle cock; pen 3737 (W. E. Hewitt), First and Cup, a White Cock.

*Short-faced Tumblers*.—This very pleasing variety brought together 83 pens in seven classes, one class for Bald, Beard, or Black Mottle, having been cancelled. They compared most favourably with all previous exhibits. Pen 3901 (J. Barton) was awarded First Prize and the Association's Medal and was also reserve for the Champion Cup—a lovely, rich-coloured Red. There was scarcely a bird that did not deserve mention amongst this most charming lot, which did their breeders great credit.

*Long-faced Tumblers* were a grand collection of 209 pens in 19 fairly-balanced classes, falling short by 14 of the entries for 1913. The quality was fully maintained, and it would have been hard to find an indifferent specimen. The awards were well received by the

exhibitors, the classification also appearing to give satisfaction. The Silver Medal of the Association went to Pen 4010 (F. May).

*English Owls* mustered 38 in five classes, an average entry for this variety. The quality in adults was of the highest order, practically, as the judge remarked, all the best in the country putting in an appearance. There was very keen competition for the Silver Medal of the Association, which went to Pen 4140 (J. Brayshaw), a grand Silver.

*Foreign Owls* made a very fine display, the quality being so good. There were 69 pens in seven classes, all fairly balanced. From the judge's remarks, he appears to have had some difficulty in finding the winners. The Medal of the Association was awarded to Pen 4213 (J. E. Kerr), a White cock.

*Turbits* had seven classes and 61 entries, a poor encouragement to the B.D.F.A. The quality of those exhibited was good and no fault could be found with the judge nominated. Pen 4288 (Miss E. Miller) was awarded the Association's Medal. This variety does not seem as popular as in the past.

*Archangels* were a splendid collection, numbering 55 in four classes. They were a very even lot and the quality was of a high class. Pen 4297 (A. P. Maurice), a cock, a lovely bird; Pen 4307 (H. W. Webb), a sweet little hen; Pen 4330 (H. W. Webb), an ideal cock, and many other A1 birds.

*Jacobins* proved a very nice, even exhibit. They numbered 67 in six classes, being 20 more than last year, which I think very satisfactory. The quality was fully up to the usual high standard.

*Runts*.—These enormous birds, as usual, attracted much attention. They had one class of 14 entries, a fine lot right through, and in splendid condition.

*Nuns* numbered 38 in four classes. They were a very taking exhibit, being much admired. Pen 4431 (F. F. Topham), an adult Black, First and Medal; Pen 4441 (J. T. Stinchcombe), 1914, First and Medal; Pen 4461 (J. Weeks), 1914, First and Medal; the three medals in question having been offered by the Nun Club.

*Oriental Frills* numbered 110 in 11 classes, which may be considered satisfactory as two of the largest exhibitors, being judges, were debarred from competing, and one class was cancelled. They made a very fine display, and although there were no birds of outstanding merit, the quality was quite up to standard. The 1914 birds showed the greatest improvement and were a very level lot, the winners of the Oriental Frills Club Trophy being Pen 4494 (J. F. King), First and Special; and Pen 4501 (H. Seaton), First and Special.

*Modenas* were only left with six classes to compete, no less than four classes unfortunately having to be cancelled through lack of sufficient entries. The judge considered the two first classes of Blues the best, and that they have shown more rapid improvement than the

Blacks and Bronzes. There were others of great excellence, First and Silver Medal of the Association falling to Pen 4576, a Gazzi (G. W. Wootton).

*Maggies* did not muster satisfactorily, there being only 48 pens in six classes, eight of which had to be cancelled for want of support. The judge, Mr. F. Warner, remarked that there was nothing of merit beyond the specimens to which prizes were awarded, and that the classification provided in the schedule was ample and would, in normal times, receive adequate support.

*Scandaroons* had three very good classes with 32 entries, the quality being well above the average. The First Prize, a Red cock, Pen 4689 (E. B. Thresher), was about as near perfection as has yet been seen.

Classes for *Swallows*, *Fairy Swallows*, *Foreign Toys*, and *Cumulets* were cancelled for want of sufficient entries.

*Antwerps* came forward with 35 in four classes, the quality being no more than moderate. Judging from the exhibits, the breed does not appear to be improving. These used to be grand classes years gone by.

*Working Homers*.—These most interesting and intelligent birds came out strong, there being 140 pens in six classes. I should like to give an extract from the judge's (Dr. W. E. Barker) report upon this section. He says:—

"Considering the troublous times through which we are passing, the police restrictions at present imposed upon keepers of racing pigeons, and the difficulties attending the transit of these birds by rail (this latter difficulty being, however, largely counteracted by the admirable methods employed by the Society), I think the entry, from the numerical standpoint (140 birds in six classes), a distinctly good and encouraging one, which justifies the inclusion of a Working Homer section in the Society's schedule."

"His Majesty the King was graciously pleased to make two entries in this section of the Show. Both these birds laboured under the disadvantage that they were rather smaller in size than the birds I usually select, and it was therefore an additional pleasure to find that, in each instance, their intrinsic merits as typical racers, and the splendid condition in which they were shown, had served to place them amongst the minor awards, one receiving a v.h.c. and the other a h.c. card."

The awards were as follows:—

Class 460. First and Cup, Pen 4741 (Harry Hyde), for adult birds flown at least 200 miles.

Class 461. First and Cup, Pen 4768 (Alfred Berris), for adult birds flown at least 100 miles.

**Class 462.** First and Cup, Pen 4799 (Harry Hyde), for cock birds (1914) flown at least 75 miles.

**Class 463.** First and Cup, Pen 4835 (Harry Hyde), for hen birds (1914) flown at least 75 miles.

*Exhibition Flying Homers* were a very even lot, but nothing to call special attention to. Five classes (55 birds) were allowed to stand, one class being cancelled. The quality of the exhibits was excellent. First and Silver Medal of the Association went to Pen 4930, a hen (John Brooke).

*Show Homers.*—This variety came up boldly, numbering 201 pens in 12 classes. The quality was quite up to the usual standard, and really first-class birds had to be content with a card only. For this variety, unfortunately, in the latter part of the day the light was not all that could be desired. If an extra window were placed at the west end of the gallery it would be an advantage which would be greatly appreciated by exhibitors. Pen 5058, a Black Chequer hen (E. Greenwood & Son), won First and Gold Medal, and the Silver Medal of the Association, and was also Reserve for the Fulton Trophy. Pen 4947 (E. Greenwood & Son), an adult cock, First and Gold Medal.

*Any Other Variety* had one class of 12, birds of great merit.

*Selling Classes* were well filled and numbered 229. I have never seen birds of such value entered in these classes before, but the amount realised was the lowest I can remember. Bearing in mind the circumstances, there is nothing surprising in this, and would-be sellers could console themselves with the reflection that the poor trade had no bearing upon the quality of the goods offered.

In concluding my report, I may say that all the arrangements worked out to my satisfaction, and thanks are due to our Secretary, who is always willing to give assistance, also to Messrs. Spratt's representatives for their ready co-operation. The new square pens that were used for certain of the varieties for the first time appear to have given no little satisfaction to exhibitors.

## APPLICATIONS FOR PATENTS FOR DAIRY APPLIANCES, &amp;c.

*From January 1st to December 31st, 1914.*

(This list is somewhat shorter than usual, as there were some 6,000 applications for Patents in a general way less than during 1913.)

No. of Application.	Name of Applicant.	Subject of Invention.
190	Cockburn, W. R., and Toogood, A. J....	Milking-machine releaser.
1,409	Carpenter, E. P. ... ..	Process of treating milk powder
1,898	Gösling, E. W. E. ... ..	Milking machines.
3,043	Moreton, C. J. ... ..	Milking apparatus.
3,044	Moreton, C. J. ... ..	Automatic milking apparatus.
3,663	Engelhardt, L. ... ..	Delivery apparatus for milk, &c.
4,028	Lanz, H. (Firm of) ... ..	Centrifugal milk separators.
4,108	Risberg, J. V. M. ... ..	Motor-driven separators with combined vacuum condenser milk heater.
4,112	Hanson, P. ... ..	Apparatus for making butter.
4,256	Todd, J. P. ... ..	Butter, &c., cutter.
4,755	Cameron, E. M.... ..	Mechanical milking plant or systems.
7,115	Baeckman, H. O. ... ..	Milking apparatus.
7,132	Boland, D. L. ... ..	Apparatus for milking cows.
7,313	Horváth, F., Jun. ... ..	Method of, and apparatus for, cutting up cheeses.
7,814	Wright, B. R. ... ..	Clarification of milk.
8,027	Gössel, F. ... ..	Manufacture of artificial milk.
8,452	Davis, C. H., and Cuff, A. D. ...	Milking machines.
9,858	Gillies, A., and Bartram, H. ...	Pneumatically-operated teat cups.
10,588	Renard, L. ... ..	Condensed milk.
10,967	Forayth, R. B. ... ..	Pulsators for milking machines.
12,091	Wallace, R. ... ..	Pulsating apparatus of cow-milking machines and the like.
12,803	Zenke, J. R. G. ... ..	Cow-tail holders.
14,118	Treloar, J. ... ..	Milking-machine apparatus.
14,540	Reese, L. G. ... ..	Preparation of artificial human milk.
14,804	Gorce, P. A. de la ... ..	Milking apparatus.
15,406	Davies, D. E. ... ..	Cow-milkers and other appliances for use in milking animals.
16,266	Wheeler, W. H.... ..	Milking machine.
16,366	Sabrol, A. ... ..	Milking machines with suction action.
16,862	Faitelowitz, A. ... ..	Process for obtaining fresh cream and milk from sour cream and sour milk.
16,952	Stratton, R. ... ..	Milking instructor.
17,738	Wielaelert, J. ... ..	Milking machines.
17,739	Wielaelert, J. ... ..	Milking machines.
17,740	Wielaelert, J. ... ..	Milking machines.
18,795	Berna Milk Co. ... ..	Process for the de-acidification of milk.



## APPLICATIONS FOR PATENTS FOR DAIRY APPLIANCES, &amp;c.

*From January 1st to December 31st, 1914—(continued).*

No. of Applica- tion.	Name of Applicant.	Subject of Invention.
20,417	Ridd, A. ... ..	Milking-machine releasers.
21,432	Pessell, R. C. ... ..	Milking machines.
21,485	Pessell, R. C. ... ..	Apparatus for use in obtaining pulsatory movements, more especially intended for use in connection with milking machines.
21,867	Davis, C. H. ... ..	Test cups for milking machines
21,873	Droullege, H. ... ..	Milk releasers.
23,367	Butler, R. R. F., and Pessell, R. C. ...	Apparatus for use in obtaining pulsatory movements, more especially intended for use in connection with milking machines.
24,534	Butler, R. R. F., and Pessell, R. C....	Apparatus for use in obtaining pulsatory movements, more especially intended for use in connection with milking machines.
24,802	Ohlsson, J. A. ... ..	Combined churn and milk separator.

## ANNUAL REPORT OF THE CONSULTING CHEMIST AND DAIRY BACTERIOLOGIST.

F. J. LLOYD, F.C.S., F.I.C.

DURING the year 1914 a larger number of samples have been submitted to me than for some years past. I wish I could report that these had come from a larger number of the members. But the increase in this respect has not been in proportion to the increase in the number of samples. Those members who have found the advantage of chemical analysis make ever increasing use of it. But there still remain far too many members who appear to carry on their business very largely on trust rather than on facts. They trust that the articles they purchase are satisfactory and up to the guarantee given, when there is a guarantee. And in a similar manner they trust that the articles they are producing are satisfactory and up to standard. Now and again there comes a rude awakening. If they are milk producers they are summoned, and then for the first time they realise that all is not well—or rather was not well two, three, or four weeks ago. How can they hope now to find out what was the cause? During the past year I have had two such cases which must have cost my clients, both dairy farmers, well over £30 to £40 each, to say nothing of the worry, time, and vexation of such proceedings and of being convicted. Less than one-fifth the money thus lost, had it been spent in a systematic control of the milk, would have saved them all trouble. People are fond enough of saying "Prevention is better than cure," but judging from my experience they do not act up to their talk.

The total number of samples analysed during the year was 538. Of these 295 were sent me by members, five by the Judges at the Dairy Show, and 238 in connection with the Milking Trials.

The samples sent by members do not call for much comment. The majority were milks, and far too many of these were sour, stale samples, which were duplicates of samples analysed by Public Analysts and reported on as unsatisfactory. Many samples were only marked 1, 2, &c., or with letters. I would suggest that it is always well to label a sample fully. If from a single cow, give name, date, and whether morn or even. If from a churn, give number, volume, whether morning or evening's milk, &c. My certificate then becomes of value as evidence, if at any time it should be required. Let me give an example. A farmer sent me two bottles of milk, without any mark on either, and asked for analyses. Shortly after an inspector sampled the milk he was supplying and he was prosecuted. Then it appeared that the two samples previously sent were from the two churns of milk he was sending away and represented the bulk. My analyses could not be utilised to any advantage because there was no evidence that the samples represented either the contents of two churns, or the whole of the milk supply, or whether it was morning's or evening's milk. Every sample should be clearly marked and as fully as possible.

A large number of samples have been sent me for the determination of Boric Acid, of which many were samples of cream, to ensure that the amount of Boric Acid present did not exceed the amount allowed or notified.

Many samples of Milk Powder have been submitted to me, partly to determine whether they were made from whole milk and contained the 24 per cent. of fat necessary, and partly for other determinations.

Of the miscellaneous samples little need be said. They are conspicuous by their small number. Neither the Feeding Stuffs bought by members nor the Manures they apply appear to be submitted to analysis.

Only one sample of water was sent me. This was pure but very "hard," containing 50 grains of solids per Imperial gallon. The use of such a hard water is attended with many inconveniences. On some estates, where water of this description is found, the introduction of an automatic softening plant has been of advantage.

Very few samples have been submitted to me for bacteriological examination. Among them were some so-called "Pure Cultures," bought for dairy work. These pure cultures are not always pure, often they contain many organisms besides the one for which they are ostensibly purchased and sold. In one case the culture was very highly contaminated. Fortunately the cheese-maker suspected it and awaited my report. Needless to say the culture was not used. Had it been received by a less careful maker probably the whole of the cheese made with it would have been very inferior, if not ruined.

In the present year farmers must anticipate higher prices for everything they buy. It therefore behoves them more than ever to ensure that they get what they have a right to. They can best do this by making more use than they have in the past of the chemical privileges which they obtain as members of the Association.

# British Dairy Farmers' Association.

## EXAMINATION FOR THE B. D. F. A. DIPLOMA.

The Association grants to any Candidate who satisfactorily passes the necessary Examinations:—

### **A Diploma and Silver Medal for Proficiency in the Science and Practice of Dairying and Dairy Farming.**

Candidates for the Diploma must have previously obtained the Butter and Cheese-making Certificates of the Association,\* and must produce satisfactory evidence that they have received not less than one year's scientific and practical instruction at some recognised centre for Dairying Instruction, and have spent at least twelve months on a farm in addition to the time spent at the Centre.

The Examination will extend over three or more days, and will test (1) the knowledge and experience of the Principles and Practice of Dairying and Dairy Farming, and (2) the skill in making Butter and Cheese, of each Candidate.

Candidates will be required to answer, in writing, sets of questions within a given time, and will also be examined *vis à voce*. They will be expected to possess a detailed and precise knowledge of all the subjects included in the following Syllabus. They will have to make both Butter and Cheese. Candidates, if required, must produce their note-books of Lectures and Demonstrations attended.

Examinations for Diploma are held in the Autumn upon dates announced in the Agricultural and Dairy Press.

Entries will close 28 days prior to the date fixed for the Examination.

The Entry Fee is 10s.

### SYLLABUS.

#### 1. DAIRYING.

(a) Milk.—The Yield of Milk from various Breeds; Milking; Handling of Milk from Cow to Dairy; Importance of Cleanliness; Cooling of Milk; Sale of Milk; Influence of Food on the Yield, Flavour, and Fat Contents of Milk; Composition of Milk, Nature and Properties of its Constituents; Differences between Morning and Evening Milk and their Causes; Methods of Sampling and Simple Methods of Testing Milk, as the Lactometer, Creamometer and Centrifugal Fat Testers; Testing for Acidity; Causes of Fermentation; Colostrum, its Nature and Properties; the Keeping of Dairy Records; the Handling of Evening's Milk for Cheese-making; Properties of Milk suitable for Cheese-making; Taints in Milk—their Causes, Effects and Remedies; Tests for such Taints; the Ripening of Milk for Cheese-making; Methods and Reasons for Ripening; use of Natural and "Culture" Starters; Pasteurization of Milk; Chilled Milk: their Subsequent Use for Cheese-making; Special Testing of Milk, Whey, and Curd requisite in a Cheese Dairy.

(b) Cream.—The Various Methods of obtaining Cream; the Construction and Use of the Utensils Employed; Separators, the Construction and Use of the various Types; Composition of Cream, Separated Milk, Skimmed Milk and Butter-milk, with Simple Tests for Fat in same; the Ripening of Cream, Objects and Results; Changes during Ripening; Testing for Acidity; Natural and Artificial Ripening and Preparation of Starters; the Preparation of Cream for Churning; Preparation of Cream for Sale; Clotted Cream.

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\*Equivalent Certificates of recognised bodies will be accepted by the Association as evidence of sufficient training to justify entry for this Examination.

- (c) **Butter.**—The Various Methods of obtaining Butter, including the Churning of Whole Milk ; Utensils required and the Preparation, Use and Care of same ; the Process of Butter Manufacture in all its Details ; Conditions which affect the Butter Yield ; Circumstances affecting the Flavour, Texture, Colour and Keeping Properties of Butter ; Dry-salting and Curing of Butter ; Faults in Butter and their Causes ; Composition and Properties of Good Butter ; Composition and Causes of Inferior Butter ; Methods of Judging Butter.
- (d) **Cheese.**—Rennet: its Preparation, Properties, and Action upon Milk ; Testing its Strength ; Storage of Rennet ; Substitutes for Rennet ; Annatto ; the Colouring ; Discoloration of Cheese ; a General Knowledge of the Manufacture of the Principal Varieties of Hard-pressed, Blue-veined, and Soft Cheeses including the use of Wood and Metal Tubs and Jacketed Vats ; Methods of Scalding ; the Development and Control of Acidity in Curd ; Salting and Brining in Cheese-making ; Bandaging ; Ripening and Storing of Hard-pressed, Blue-veined and Soft Cheeses ; Defects in Cheese and their Causes ; Composition of Cheese ; Composition and Utilization of Whey ; the Manufacture of Whey Butter ; the Equipment of a Cheese Dairy and its Cost ; the Care of Utensils.

The detailed Principles and Practice requisite for the Manufacture of one of the following types of Cheese—to be selected and made by the Candidate :—

- (a) A Hard-pressed British Cheese (not less than 25 lbs. weight).  
(b) A Blue-veined British Cheese (not less than 10 lbs. weight)

## 2 DAIRY FARMING.

(a) The General Principles and Practice of Dairy Farming ; the Management and Equipment of a Dairy Farm.

(b) **Agricultural Botany.**—Appearance and Identification of the Common Varieties of Grasses and other Pasture Plants and Weeds. Their Effects upon Milk and Dairy Produce.

(c) **Crops.**—A General Knowledge of the Cultivation, Manuring and Harvesting of Farm Crops with a Special Knowledge of those Crops employed in the Feeding of Dairy Stock ; the Management of Pasture and Meadow Land ; Haymaking and Ensilage : the Factors which bear on their value as Fodder for Stock.

(d) **Foods and Feeding.**—The Effect of various Foods on Milk and its Products ; Systems of Feeding and the Compilation of Rations.

(e) **Live Stock.**—Characteristics and Management of Different Breeds of Cattle ; their Breeding and Rearing ; Choice of Dairy Cattle for Special Purposes and Situations ; Pigs and Poultry ; Suitable Breeds for Use in Connection with a Dairy Farm and their Management ; Horses.

(f) **Diseases of Dairy Stock**, such as : Tuberculosis, Anthrax, Foot and Mouth Disease, Contagious and Sporadic Abortion, Chronic and Acute Indigestion, Mastitis, Milk Fever, Sore Teats, Husk, Diarrhoea, White Scour in Calves, Common Causes of Poisoning.

(g) **Physiology of Digestion and Milk Secretion.**

(h) **Buildings suitable for a Dairy Farm** : their Situation, Construction, Ventilation, Drainage, &c. ; Water Supply.

(i) **Book-keeping on a Dairy Farm** ; Milk Records ; Business Methods involved in Dairying and Dairy Farming.

(k) **Farm Implements and Machines** ; their construction and use.

**3. AGRICULTURAL CHEMISTRY.**

(a) General.—The Chemical Elements and Constituents found in Milk, Soils, Plants, Manures, Animals and Foods: their Nature and Properties so far as they relate to Agriculture; the simpler Laws of Chemical Combination and Change so far as regards these Substances.

(b) Dairy.—The Composition and Properties of Milk, Cream, Butter, Cheese, and Dairy Products, and of all Substances used in the Dairy; Simple Methods of Analysis as applied to these Substances; the Chemical Changes which may take place in Milk, Cream, Butter, &c.

(c) Agricultural.—The Composition and the Chief Chemical and Physical Properties of Soils, and their Constituents; the Chemical Means of Ameliorating the Soil; the Source, Composition, and Use of the usual Natural and Artificial Manures; the Chemistry of Plant Growth; the Composition of Crops; the Source, Composition, and Use of Artificial Feeding Stuffs; Drinking Waters; the Chemistry of Animal Nutrition.

**4. AGRICULTURAL BACTERIOLOGY.**

(a) General.—Bacteria, their Form, Classification, Growth and Reproduction; The Microscope and its Use; Staining and Microscopic Examination of Bacteria; Methods of Isolation and Cultivation; Preparation of Culture Media; Fermentations and Chemical Changes produced by Bacteria; Enzymes and their Action; Effects of Heat, Cold, Sterilization, Pasteurization, Disinfectants, and Preservatives on Bacteria and Enzymes.

(b) Dairy Bacteriology.—The Bacteria of Milk and Dairy Products; Examination of Milk for Foreign Bodies, Sediment, Blood, Pus, and Pathogenic Organisms; the Bacteriology of Milk, Cream, Butter, and Cheese; Commercial Bacterial Preparations for use in the Dairy; Bacteria Injurious to Dairy Produce: their Source, Nature, and Treatment.

(c) Agricultural Bacteriology.—The Bacteria of the Soil; Bacteriological Examination of Soils, Air, Water, &c.; Action of Heat and Antiseptics on Soil Bacteria; Nitrification; Bacteriology of Farmyard and other Manures; Plant Bacteria and Assimilation of Nitrogen.

(d) Fungi (Moulds) and Yeasts.—Their Forms, Classification, and Growth; their Relation to Dairy Produce, to Soils and Plants, and to Feeding Stuffs.

Particulars and Entry Forms may be obtained from

The SECRETARY,

BRITISH DAIRY FARMERS' ASSOCIATION,

28, Russell Square, London, W.C.

## EXAMINATION FOR DAIRY TEACHER'S CERTIFICATE.

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The Association grants to any Candidate who satisfactorily passes the necessary Examinations :—

### A Teacher's Certificate for Proficiency in the Science and Practice of Dairying.

Candidates for this Certificate must have previously obtained the Butter and Cheese-making Certificates of the Association,\* and must produce satisfactory evidence that they have received not less than twelve months' instruction at a recognised centre for dairy instruction.

The Examination will extend over three or more days, and will test (1) The Theoretical Knowledge of the Candidates; (2) their skill in making Butter and Cheese; and (3) their ability to teach and elucidate the Elementary Principles and Practice of Dairying.

Candidates will be required to answer, in writing, sets of questions within a given time, and will also be examined *viva voce*. They will be expected to possess a detailed and precise knowledge of the subjects included in the following Syllabus, together with a fair knowledge of the General Management and Feeding of Dairy Cattle. They must produce a Certificate of their ability to milk. Candidates, if required, must produce their note-books of Lectures and Demonstrations attended.

Examinations for Teacher's Certificates are held in the Autumn, upon dates announced in the Agricultural and Dairy Press.

Entries will close 28 days prior to the date fixed for the Examination.

The Entry Fee is 10s.

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### SYLLABUS.

1. **Milk.**—The Yield of Milk from various breeds; Milking; Handling of Milk from cow to dairy; Importance of Cleanliness; Cooling of milk; Sale of Milk; Influence of Foods on the Yield, Flavour, and Fat Contents of Milk; Composition of Milk, Nature and Properties of its Constituents; Differences between Morning and Evening Milk and their causes; Methods of Sampling, and Simple Methods of Testing Milk, as the Lactometer, Creamometer, and Centrifugal Fat Testers; Testing for Acidity; Causes of Fermentation; Colostrum, its Nature and Properties; the Keeping of Dairy Records; the Handling of Evening's Milk for Cheese-making; Properties of Milk suitable for Cheese-making; Taints in Milk, their Causes, Effects and Remedies; Tests for such Taints; the Ripening of Milk for Cheese-making; Methods and Reasons for Ripening; Use of Natural and "Culture" Starters; Pasteurization of Milk; Chilled Milk; their subsequent Use for Cheese-making; Special Testing of Milk, Whey, and Curd requisite in a Cheese Dairy.
2. **Cream.**—The Various Methods of Obtaining Cream; the Construction and Use of the Utensils employed; Separators, the Construction and Use of the various Types; Composition of Cream, Separated Milk, Skimmed Milk, and Butter-milk, with Simple Tests for Fat in same; the Ripening of Cream: Objects and Results; Changes during Ripening, Testing for Acidity; Natural and Artificial Ripening and Preparation of Starters; the Preparation of Cream for Churning; Preparation of Cream for Sale; Clotted Cream.
3. **Butter.**—The Various Methods of obtaining Butter, including the Churning of Whole Milk; Utensils required and the Preparation, Use and Care of

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\*Equivalent Certificates of recognised bodies will be accepted by the Association as evidence of sufficient training to justify entry for this Examination.

same; the Process of Butter Manufacture in all its details; Conditions which affect the Butter Yield; Circumstances affecting the Flavour, Texture, Colour and Keeping Properties of Butter; Dry-salting and Curing of Butter; Faults in Butter and their causes; Composition and Properties of Good Butter; Composition and Causes of Inferior Butter; Methods of Judging Butter.

4. Cheese.—Rennet: its Preparation, Properties, and Action upon Milk: Testing its Strength; Storage of and Substitutes for Rennet; Annatto; the Colouring of Cheese; Discoloration; a General Knowledge of the Manufacture of the Principal Varieties of Hard-pressed, Blue-veined, and Soft Cheeses, including the use of Wood and Metal Tubs and Jacketed Vats; Methods of Scalding; the Development and Control of Acidity in Curd; Salting and Brining in Cheese-making; Bandaging; Ripening and Storing of Hard-pressed, Blue-veined, and Soft Cheeses; Defects in Cheese and their Causes; Composition of Cheese; Composition and Utilization of Whey; the Manufacture of Whey Butter; the Equipment of a Cheese Dairy, and its Cost; the Care of Utensils; the Detailed Principles and Practice requisite for the Manufacture of one of the following types of Cheese, as also of a Soft Cheese to be selected and made by the Candidate:—

(a) Hard-pressed British Cheese (not less than 25 lbs. weight).

(b) Blue-veined British Cheese (not less than 10 lbs. weight).

5. Dairy Farming.—Its General Principles, Practice, and Management.

6. Food and Feeding Stuff.—Suitable and Unsuitable Foods; Suitable Rations; Preparation of Food for Dairy Stock.

7. General Book-keeping of a Dairy.

8. The Method of Organising an Itinerant Dairy Class.

9. DAIRY CHEMISTRY.—The Chemical Elements and Constituents found in Milk, Animals and Foods; their Nature and Properties so far as they relate to Dairying; the Composition, and the Properties of the Constituents of Milk, Cream, Butter, Cheese, and Dairy Products, and of all Substances used in the Dairy; Simple Methods of Analysis as applied to these Substances; the Chemical Changes which may take place in Milk, Cream, Butter, &c.

10. DAIRY BACTERIOLOGY.

(a) Bacteria, their Form, Classification, Growth and Reproduction; The Microscope and its Use; Staining and Microscopic Examination of Bacteria; Methods of Isolation and Cultivation; Preparation of Culture Media; Fermentations and Chemical Changes produced by Bacteria; Enzymes and their Action; Effects of Heat, Cold, Sterilization, Pasteurization, Disinfectants, and Preservatives on Bacteria and Enzymes.

(b) The Bacteria of Milk and Dairy Products; Examination of Milk for Foreign Bodies, Sediment, Blood, Pus, &c.; the Bacteriology of Milk, Cream, Butter and Cheese; Commercial Bacterial Preparations for Dairy use; Bacteria Injurious to Dairy Produce—their Source, Nature, and Treatment.

(c) Fungi (Moulds) and Yeasts.—Their Forms, Classification, and Growth; their Relation to Dairy Produce.

Particulars and Entry Forms may be obtained from

The SECRETARY,

BRITISH DAIRY FARMERS' ASSOCIATION,

28, Russell Square, London, W.C.



## EXAMINATION FOR CHEESEMAKING CERTIFICATE.

The Association grants to any Candidate who satisfactorily passes the necessary Examination—

### A Certificate of Merit for Proficiency in the Theory and Practice of Cheesemaking.

The Examination, which will extend over two or more days, will test the Theoretical Knowledge of the Candidates and their Practical Skill in Cheesemaking. Each Competitor will be required to answer, in writing, a set of questions within a given time, and will also be examined *viva voce*. On the same or following day a Practical Examination in Cheesemaking will take place.

Candidates for this Certificate must, at the time of entry, produce satisfactory evidence that they have received at least twelve months' instruction in the Theory and Practice of Cheesemaking, of which at least six months must have been spent at a recognised centre for dairy instruction. They must possess a fair knowledge of the subjects included in the following Syllabus.

They must have full knowledge of the production of one variety of Hard-pressed or Blue-veined British Cheese, also a general knowledge of the manufacture of other varieties of Hard-pressed Cheese, and of Soft Cheese. They will be required to make at least one Hard-pressed or Blue-veined British Cheese as detailed below.

Candidates are at liberty to bring their own utensils for the Practical Examination if they wish to do so

Examinations for Cheesemaking Certificates are held twice a year, viz., in the Spring and Autumn, upon dates announced in the Agricultural and Dairy Press.

Entries will close 28 days prior to the date fixed for the Examination.

The Entry Fee is 5s.

### SYLLABUS.

1. **Milk.**—The Yield of Milk from various breeds; Milking; Handling of Milk from Cow to Dairy; Importance of Cleanliness; Cooling of Milk; Influence of Food on the Yield, Flavour and Fat Contents of Milk. Composition of Milk, Nature and Properties of its Constituents; Differences between Morning and Evening Milk and their Causes; Methods of Sampling and Simple Methods of Testing Milk, as the Lactometer, Creamometer, Centrifugal Fat Testers; Testing for Acidity; Causes of Fermentation; Colostrum, its nature and properties; the Keeping of Dairy Records; the Handling of Evening's Milk for Cheesemaking; Properties of Milk suitable for Cheesemaking; Taints in Milk, their Causes, Effects and Remedies; Tests for such Taints; the Ripening of Milk for Cheesemaking; Methods and Reasons for Ripening; use of Natural and "Culture" Starters; Pasteurization of Milk; Chilled Milk; their Subsequent use for Cheesemaking; Special Testing of Milk, Whey, and Curd requisite in a Cheese Dairy.

2. Cheese.—Rennet: its Preparation, Properties, and Action upon Milk; Testing its Strength; Storage of and Substitutes for Rennet; Annatto; the Colouring of Cheese; Discoloration; a General Knowledge of the Manufacture of the Principal Varieties of Hard-pressed, Blue-veined, and Soft Cheeses, including the use of wood and metal tubs and jacketed vats; Methods of Scalding; the Development and Control of Acidity in Curd; Salting and Brining in Cheese-making; Bandaging; Ripening and Storing of Hard-pressed, Blue-veined and Soft Cheeses; Defects in Cheese and their causes; Composition of Cheese; Composition and Utilization of Whey; the Manufacture of Whey Butter; the Equipment of a Cheese Dairy and its Cost; the care of Utensils; the Detailed Principles and Practice requisite for the Manufacture of one of the following types of Cheese—to be selected and made by the Candidate :—

- (a) A Hard-pressed British Cheese (not less than 25 lbs. weight).
- (b) A Blue-veined British Cheese (not less than 10 lbs. weight).

Particulars and Entry Forms may be obtained from

The SECRETARY,

BRITISH DAIRY FARMERS' ASSOCIATION,

28, Russell Square, London, W.C.

## EXAMINATION FOR BUTTERMAKING CERTIFICATE.

The Association grants to any Candidate who satisfactorily passes the necessary Examination—

### A Certificate of Merit for Proficiency in the Theory and Practice of Butter-making.

The Examination, which will extend over two or more days, will test the Theoretical Knowledge of the Candidates and their Practical Skill in Buttermaking. Each Competitor will be required to answer, in writing, a set of questions within a given time, and will also be examined *viz voce*. On the same or following day a Practical Examination in Buttermaking will take place.

Candidates for this Certificate must, at the time of entry, produce satisfactory evidence that they have received at least three months' instruction (not necessarily at a Dairy School) in the Theory and Practice of Buttermaking. They must possess a fair knowledge of the subjects included in the following Syllabus. They will be required to make Butter.

Candidates are at liberty to bring their own utensils for the Practical Examination if they wish to do so.

Examinations for Buttermaking Certificates are held twice a year, *viz.*, in the Spring and Autumn, upon dates announced in the Agricultural and Dairy Press.

Entries will close 28 days prior to the date fixed for the Examination.

The Entry Fee is 5s.

### SYLLABUS.

1. Milk.—The Yield of Milk from various breeds; Milking; Handling of Milk from cow to dairy; Importance of Cleanliness; Cooling of Milk; Sale of Milk; Influence of Foods on the Yield, Flavour and Fat Contents of Milk; Composition of Milk, Nature and Properties of its constituents; Differences between Morning and Evening Milk and their causes; Methods of Sampling and Simple Methods of Testing Milk, as the Lactometer, Creamometer, and Centrifugal Fat Testers; Testing for Acidity; Causes of Fermentation; Colostrum, its nature and properties; the Keeping of Dairy Records.
2. Cream.—The Various Methods of Obtaining Cream; the Construction and Use of the Utensils employed; Separators, the Construction and Use of any one Type; Composition of Cream; Separated Milk, Skimmed Milk, and Butter-milk, with Simple Tests for Fat in same; the Ripening of Cream—Objects and Results; Changes during Ripening; Testing for Acidity; Natural and Artificial Ripening and Preparation of Starters; the Preparation of Cream for Churning; Preparation of Cream for Sale; Clotted Cream.
3. Butter.—The Various Methods of Obtaining Butter, including the Churning of Whole Milk; Utensils required, and the Preparation, Use, and Care of same; the Process of Butter Manufacture in all its details; Conditions which affect the Butter Yield; Circumstances affecting the Flavour, Texture, Colour, and Keeping Properties of Butter; Dry-salting and Curing of Butter; Faults in Butter and their causes; Composition and Properties of Good Butter; Composition and Causes of Inferior Butter; Methods of Judging Butter.

Particulars and Entry Forms may be obtained from

THE SECRETARY,

BRITISH DAIRY FARMERS' ASSOCIATION,  
28, Russell Square, London, W.C.

# EXAMINATIONS

AT

## LOCAL CENTRES.

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In order to meet the convenience of Students at Dairy Schools, members of local Societies, and other persons, the Association will conduct Examinations for its Diplomas and Certificates at any place in the United Kingdom upon receiving satisfactory proof that the following conditions will be observed :—

That the School, Society, County Council, or other body requesting such an Examination to be held, undertake :—

- (1) To supply all necessary appliances and materials.
  - (2) To pay the fees and expenses of the Examiners.
  - (3) To supply the milk required free from preservatives and fit for Cheesemaking.
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Copies of Question Papers set at recent examinations may be obtained at 3d. per copy.

Applicants are requested to state whether Diploma, Cheese, or Butter Questions are required.

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Further particulars and Entry Forms for Students may be obtained from  
The SECRETARY,

BRITISH DAIRY FARMERS' ASSOCIATION,

28, Russell Square, London, W.C.

EXAMINATION FOR BUTTERMILKING CERTIFICATES AT  
THE BRITISH DAIRY INSTITUTE, READING; ON  
TUESDAY, WEDNESDAY, AND THURSDAY, JUNE 16TH  
17TH, AND 18TH, 1914.

EXAMINERS: C. W. WALKER TISDALE  
AND F. J. LLOYD, F.C.S., F.I.C.

Three hours are allowed for this paper.

Candidates will also be examined *visà voce* by each Examiner. Each question carries the same number of marks, and candidates gaining over 60 per cent. will pass.

Candidates are requested to make their answers as brief as possible, brief and accurate. Each answer should be written on a separate sheet of paper, and subsequently the sheets should be fastened together in order in the left-hand corner. The top sheet should bear the name of the candidate

QUESTIONS.

1. Explain how the keeping of milk records can be utilised so as to result in financial gain to a Dairy Farmer.
2. Describe briefly the preparation and use of starter in butter-making.
3. Assume that you churn one gallon of cream at a temperature of 56 deg. F. and at the breaking stage the temperature registers 60 deg. F., state any simple rule for ascertaining the amount of breaking water and its temperature to be added to the cream.
4. Work out the financial return for a cow which yields 600 gallons of milk in the year, the average quality of the milk being 3·8 % butter-fat. Value the butter at 1s. 2d. per lb., the separated milk at 2d. per gallon, and buttermilk 1d. per gallon.
5. Explain how you would score butter on points. State a standard of points for judging and how you would award them.
6. Explain briefly the cooling of milk by means of a refrigerator in which water is employed. What quantity of water approximately would be required to cool 20 gallons of milk.
7. What is the most desirable quality for cream that is to be used for churning purposes? If the cream is either too rich or too poor how would this affect the churning?
8. Explain the use of the Lactometer. If 20 % of water be added to milk with a specific gravity of 1·032, what would be the specific gravity of the resulting mixture.
9. State the average composition of milk, morning and evening separately, of a herd of ordinary Shorthorns, milked at 14 and 10 hours' intervals respectively.
10. To what purposes can the separated milk from a buttermilking dairy be profitably applied.

EXAMINATION FOR CHEESEMAKING CERTIFICATES AT  
THE BRITISH DAIRY INSTITUTE, READING; ON  
TUESDAY, WEDNESDAY, AND THURSDAY, JUNE  
16TH, 17TH, AND 18TH, 1914.

EXAMINERS: JOSEPH RIGBY and F. J. LLOYD, F.C.S., F.I.C.

Three hours are allowed for this paper.

Candidates will also be examined *visu voce* by each Examiner. Each question carries the same number of marks, and Candidates gaining over 60 per cent. will pass.

Candidates are requested to make their answers as brief as possible—brief and accurate. Each answer should be written on a separate sheet of paper, and subsequently the sheets should be fastened together in the left-hand corner. The top sheet should bear the name of the Candidate.

QUESTIONS.

1. What is the best morning's temperature for the milk of the previous evening, and why?
2. What guides you in the treatment of the night's milk to obtain this temperature?
3. Describe a curd when ready for vatting, and the texture of a curd in which acidity is developed (*a*) slowly, (*b*) quickly.
4. What degrees of acidity are best suited to curds intended for (1) Cheddar, (2) Cheshire, (3) Wensleydale, and why?
5. What causes "mealiness" and what "soapiness" in cheese?
6. Describe favourable and unfavourable conditions for the growth of blue mould in cheese.
7. Describe a well-constructed store-room for ripening cheese.
8. Explain the action of rennet upon milk, and state the factors which affect its action.
9. Compare the composition of milk from a hilly limestone formation with that from low-lying meadows, and explain why the former is superior for cheese-making.
10. How would you determine whether a cheese was made from whole milk or partly skimmed milk?

EXAMINATION FOR BUTTERMAKING, CHEESEMAKING,  
AND DAIRY TEACHERS' CERTIFICATES AT THE  
DAIRY DEPARTMENT, COUNTY LABORATORIES,  
CHELMSFORD; ON MONDAY, TUESDAY, AND  
WEDNESDAY, JULY 27TH, 28TH, AND 29TH, 1914.

EXAMINERS: MR. MILES BENSON and MR. F. J. LLOYD, F.C.S.

Three hours are allotted to Candidates for Dairy Teachers' Certificates, or both Butter and Cheese Making Certificates; and *two* hours to Candidates for either Cheesemaking or Buttermaking Certificates. Candidates will also be examined *viva voce*. Each question carries the same number of marks, and Candidates gaining over 60 per cent. will pass.

Candidates are requested to make their answers as brief as possible—brief and accurate. Each answer should be written on a separate sheet of paper, and subsequently the sheets should be fastened together in order in the left-hand corner.

*Candidates are required to answer the following questions:—*

FOR BUTTERMAKING CERTIFICATE ... Nos. 1 to 9 inclusive.  
FOR CHEESEMAKING CERTIFICATE \* ... Nos. 10 to 19 inclusive  
FOR DAIRY TEACHERS' CERTIFICATE\*... Nos. 1 to 19 inclusive

\* These Candidates must attempt Question No. 14.

QUESTIONS.

1. State the chief causes for the fluctuations in the composition of milk from a herd of cows, and for each cause indicate the probable extent for such fluctuation.
2. How can you determine the acidity, the fat, and the total solids in milk?
3. Explain what causes the ripening of cream.
4. How do you determine when cream is fit for churning?
5. What objects do you expect to attain by ripening cream?
6. Why do you wash the butter grains in the churn? State all the results you desire to obtain by washing and brining.
7. What are the chief causes:—
  - (a) Of inferior butter?
  - (b) Of butter which does not keep?

8. If you were asked to judge some samples of butter, how would you proceed, and what conclusions would you draw from your observations?
9. From an ordinary herd of dairy cattle what should be, per annum:—
  - (a) The average milk production of each cow?
  - (b) The average percentage of fat in this milk?
  - (c) The yield of butter?
10. What qualities would you expect to find in milk which is known to make high-class cheese?
11. Describe roughly the features of a farm that would be likely to produce such milk.
12. What is the test on which you rely for some indication as to how milk is likely to "work" in the subsequent process of cheesemaking?
13. On what occasions would you use Annatto in cheesemaking? By what simple tests can you identify Annatto from an imitation of Annatto?
- \*14. In the making of a hard pressed cheese (that is working satisfactorily in every way) which factor do you consider of the first importance when deciding the time at which the whey shall be drawn:—
  - (a) The degree of acidity that your curd has arrived at; or
  - (b) The degree of hardness or dryness of the curd?Give reasons for your answer.  
\* Question 14 to be attempted by all Candidates.
15. Quote the broad lines on which you would make a cheese from Pasteurized milk. Restrict your answer to not more than 150 words.
16. How is it that tainted curds are frequently salted and vatted in too sweet a condition? What do cheeses from such curds appear like, externally, when matured?
17. The temperature of the atmosphere of a hard pressed cheese room reaches 75° Fah. on ten successive days. What immediate and ultimate results will this temperature have upon the cheeses stored in that room?
18. What are the conditions which produce the desired crinkled coat on a Stilton cheese? How does very hot weather affect the crinkling formation on the rind of a Stilton?
19. What degree of moisture do you prefer in a ripening room for hard pressed cheese? How would a very damp ripening room affect:—
  - (a) Cheddar cheeses?
  - (b) Stilton cheeses?

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Candidates for Dairy Teachers' Certificates will be required to answer six additional questions after two hours' interval.



**EXAMINATION FOR DAIRY TEACHERS' CERTIFICATES  
AT CHELMSFORD; ON MONDAY, TUESDAY, AND  
WEDNESDAY, JULY 27TH, 28TH, AND 29TH, 1914.**

**EXAMINERS: MR. MILES BENSON and MR. F. J. LLOYD, F.C.S.**

**SECOND PAPER.**

Dairy Teacher Candidates will be allowed  $1\frac{1}{2}$  hours to answer the following questions:—

Three out of the four on Dairy Chemistry.

Three out of the four on Dairy Bacteriology.

**DAIRY CHEMISTRY QUESTIONS.**

1. What are the chemical constituents found in milk? State how you would demonstrate their presence.
2. What are the chief chemical constituents of feeding stuffs? State for each its characteristic chemical nature.
3. What is the composition of a Cheddar cheese? Compare it with that of a soft cheese.
4. State the chemical changes produced by rennet in milk.

**DAIRY BACTERIOLOGY QUESTIONS.**

5. In what respects does the streptococcus differ from the bacillus acid lactici?
6. How would you prepare slides of Cheddar cheese for the microscopical examination of the bacteria present?
7. What organisms produce gassy curd? Fully describe each variety mentioned.
8. Describe the mould which produces the so-called "blue veined cheeses."

EXAMINATION FOR BUTTERMAKING CERTIFICATE AT  
THE BRITISH DAIRY INSTITUTE, READING; ON  
MONDAY, TUESDAY, WEDNESDAY, AND THURSDAY,  
SEPTEMBER 21ST, 22ND, 23RD, AND 24TH, 1914.

EXAMINERS: MR. C. W. WALKER-TISDALE, and MR. F. J. LLOYD,  
F.I.C., F.C.S.

Two hours are allotted to Candidates to answer the questions contained on this sheet.

Candidates will also be examined *visa voce*. Each question carries the same number of marks, and Candidates gaining over 60 per cent. will pass.

Candidates are requested to make their answers as brief as possible—brief and accurate. Each answer should be written on a separate sheet of paper, and subsequently the sheets should be fastened together in order in the left-hand corner.

1. What would you expect to be the average yield of butter per 100 lbs. of milk
  - (a) from Shorthorn cows,
  - (b) from Jersey cows,
  - (c) from Ayrshire cows,
  - (d) from Hereford cows.
2. State the causes other than the poorness of milk which might produce a poor yield of butter.
3. What do you understand by the term "Churnability of Cream." State all the factors which influence churnability.
4. How would you ascertain if cream is sufficiently ripe for churning? State the advantages of ripening cream for buttermaking.
5. To what extent does evening's milk differ from morning's milk in quantity and quality?
6. State what methods can be adopted for obtaining thick or thin cream from a separator, and explain the action of each method.
7. Describe the best method of obtaining clotted cream, and state the chief precautions to be observed.
8. Enumerate what you consider the chief faults found in butter and state the cause of each.

EXAMINATION FOR CHEESEMAKING CERTIFICATE AT  
THE BRITISH DAIRY INSTITUTE, READING; ON  
MONDAY, TUESDAY, WEDNESDAY, AND THURSDAY,  
SEPTEMBER 21ST, 22ND, 23RD, AND 24TH, 1914.

EXAMINERS: MR. JOSEPH RIGBY and Mr. F. J. LLOYD, F.I.C., F.C.S.

Two hours are allotted to Candidates to answer the questions contained on this sheet.

Candidates will also be examined *viva voce*. Each question carries the same number of marks, and Candidates gaining over 60 per cent. will pass.

Candidates are requested to make their answers as brief as possible—brief and accurate. Each answer should be written on a separate sheet of paper, and subsequently the sheets should be fastened together in order in the left-hand

1. Describe the operation of milking
  - (a) by hand,
  - (b) by machinery,
 and explain its principles.
2. Describe the treatment of the night's milk intended for cheese-making.
3. What are the chief difficulties met with in making cheese from purchased milk coming from a distance?
4. How do you deal with the night's milk if it is found in the morning to be
  - (a) over ripe,
  - (b) under ripe?
5. What is meant by a weak curd and a dry curd, and what are the causes?
6. Describe the difference in the treatment of curd to produce
  - (a) an early ripening,
  - (b) a long keeping cheese.
7. Why is it that Cheddar cheeses are pressed at once after grinding and salting, while Cheshires are left till next morning?
8. Describe a well-constructed cheese dairy and its equipment for dealing with the milk of 50 cows daily.

**EXAMINATION FOR DIPLOMAS AND DAIRY TEACHERS' CERTIFICATES AT THE BRITISH DAIRY INSTITUTE, READING; ON MONDAY, TUESDAY, WEDNESDAY, AND THURSDAY, SEPTEMBER 21ST, 22ND, 23RD, AND 24TH, 1914.**

**EXAMINERS :** MR. JOSEPH RIGBY, MR. C. W. WALKER-TISDALE,  
and MR. F. J. LLOYD, F.C.S.

Two hours are allotted to Candidates to answer the questions contained on this sheet.

Candidates will also be examined *viva voce*. Each question carries the same number of marks, and Candidates gaining over 60 per cent. will pass.

Candidates are requested to make their answers as brief as possible—brief and accurate. Each answer should be written on a separate sheet of paper, and subsequently the sheets should be fastened together in order in the left-hand corner.

**DAIRYING QUESTIONS.**

1. State the advantages to be secured by keeping Dairy Herd Records where the milk is produced for the object of buttermaking.
2. Calculate the percentage of fat present in milk if under proper conditions of manufacture it yielded 1 lb. of butter from 26 lbs. of milk.
3. State all the factors which should influence you in deciding upon the best temperature at which to churn.
4. What advantages and disadvantages are there in making butter from sweet cream?
5. State how you would utilise separated milk to the best advantage.
6. Explain how you would demonstrate to a class the merits and demerits of a sample of butter.
7. Describe the general method employed in organising an Itinerant Dairy Class.
8. State a suitable daily ration for a dairy cow in full milk during winter. What particular foods would you recommend to produce the best quality butter? Which foods are likely to cause inferior quality butter?

**EXAMINATION FOR DIPLOMAS AND DAIRY TEACHERS' CERTIFICATES AT THE BRITISH DAIRY INSTITUTE, READING; ON MONDAY, TUESDAY, WEDNESDAY, AND THURSDAY, SEPTEMBER 21ST, 22ND, 23RD, AND 24TH, 1914.**

**EXAMINERS: MR. JOSEPH RIGBY, MR. C. W. WALKER-TISDALE, and MR. F. J. LLOYD, F.C.S.**

Two hours are allotted to Candidates to answer the questions contained on this sheet.

Candidates will also be examined *visu voce*. Each question carries the same number of marks, and Candidates gaining over 60 per cent. will pass.

Candidates are requested to make their answers as brief as possible—brief and accurate. Each answer should be written on a separate sheet of paper, and subsequently the sheets should be fastened together in order in the left-hand corner.

**DAIRY CHEMISTRY QUESTIONS.**

1. How can you simply demonstrate what constituents are present in milk?
2. Into what classes may the nitrogenous constituents of foods (including milk) be roughly divided, and what is the chief characteristic of each class?
3. What is the chief chemical change taking place in curd from the time the whey is drawn to the time the curd is in the press?
4. What is the composition of a good sample of milk powder?

**DAIRY BACTERIOLOGY QUESTIONS.**

5. Describe, and compare, the ordinary lactic acid bacillus invariably found in milk, and the streptococcus now used in starters.
6. What are anaerobic organisms, and which of these are of most importance in dairying?
7. What are the coli organisms? What changes are most characteristic of their growth, and what effect have they on dairy produce?
8. Describe the mould most essential to the production of a soft cheese, and the chemical changes it brings about.

**EXAMINATION FOR DIPLOMAS AT THE BRITISH DAIRY INSTITUTE, READING; ON MONDAY, TUESDAY, WEDNESDAY, AND THURSDAY, SEPTEMBER 21ST, 22ND, 23RD, AND 24TH, 1914.**

**EXAMINERS: MR. JOSEPH RIGBY, MR. C. W. WALKER-TISDALE, and MR. F. J. LLOYD, F.C.S.**

Three hours are allotted to candidates for DIPLOMAS to answer the questions contained on this sheet.

Candidates will also be examined *viva voce*. Each question carries the same number of marks, and candidates gaining over 60 per cent. will pass.

Candidates are requested to make their answers as brief as possible — brief and accurate. Each answer should be written on a separate sheet of paper, and subsequently the sheets should be fastened together in order in the left-hand corner.

**DAIRY FARMING QUESTIONS.**

1. Give the equipments of a Dairy Farm, two-thirds being grass.
2. Describe the effects of—
  - (a) good sound pasture
  - (b) indifferent pastureon milk and cheese made from it.
3. What is the difference in feeding value of hay, badly got in a wet season, and well got in a good one?
4. Describe the cultivation of the mangold crop.
5. What is an average yield per acre of wheat, oats, barley, swedes, and cabbage?
6. Describe two or three different ways of rearing calves from birth, and discuss them from an economic standpoint.
7. Give some of the common diseases of the udder and teats of cattle, their causes and remedies.
8. Describe the feeding and treatment of pigs from birth to baconers of 8 scores.
9. What artificial manures would you recommend for use on poor quality low-lying pastures. State the quantities you would use, and cost of same.
10. On a farm where dairy cows are bred, what means should be taken to ensure that all animals are free from tuberculosis? Describe in detail your method.

## EXAMINATION RESULTS, 1914.

### EXAMINATION FOR BUTTERMILKING AND CHEESEMAKING CERTIFICATES AT THE BRITISH DAIRY INSTITUTE, READING, ON TUESDAY, WEDNESDAY, AND THURSDAY, JUNE 16TH, 17TH, AND 18TH.

- A Certificate of Merit for Proficiency in the Theory and Practice of Butter-making and Cheesemaking to Thomas J. Gripper, Miss Dorothy V. Dearden, William Petre, Thomas A. Hole, Miss Morfydd Watts, and Miss May C. Thomas.
- A Certificate of Merit for Proficiency in the Theory and Practice of Butter-making to Herbert P. Borlase, Miss Gladys M. I. List, Miss Benedicta Yeatman, Miss Kathleen M. Thornbery, and Stanton Gibson.
- A Certificate of Merit for Proficiency in the Theory and Practice of Cheesemaking to Charles H. F. Wollaston, Miss Constance M. Stokes, and Miss Nira M. D. Blyth.

### EXAMINATION FOR TEACHERS' BUTTERMILKING AND CHEESE- MAKING CERTIFICATES AT THE COUNTY DAIRY SCHOOL, CHELMSFORD, ON MONDAY, TUESDAY, AND WEDNESDAY, JULY 27TH, 28TH, AND 29TH.

- A Certificate of Merit for Proficiency in the Theory and Practice of Butter-making and Cheesemaking to Miss Hilda E. Ellingworth.
- A Certificate of Merit for Proficiency in the Theory and Practice of Butter-making to Miss Nellie L. Padfield, Miss Alice R. Garner, Miss Winifred C. Lawton, Ernest C. Pearson, and Harold A. Geldard.
- A Certificate of Merit for Proficiency in the Theory and Practice of Cheesemaking to Miss Gladys M. I. List.

### EXAMINATION FOR DIPLOMAS AND CERTIFICATES AT THE BRITISH DAIRY INSTITUTE, READING, ON TUESDAY, WEDNESDAY, THURSDAY, AND FRIDAY, SEPTEMBER 22ND, 23RD, 24TH, and 25TH.

- A Diploma and Silver Medal for Proficiency in the Science and Practice of Dairying and Dairy Farming to Miss Dorothy V. Dearden, and Thomas A. Hole.
- A Teacher's Certificate for Proficiency in the Science and Practice of Dairying to Miss Florence M. Twose.
- A Certificate of Merit for Proficiency in the Theory and Practice of Butter-making and Cheesemaking to Stephen Bartlett, Harry Harries, Isaac Jones, and Miss Annie Prichard.
- A Certificate of Merit for Proficiency in the Theory and Practice of Cheesemaking to Stanton Gibson.
- A Certificate of Merit for Proficiency in the Theory and Practice of Butter-making to Thomas Carswell, Miss Hilda Bisset, Miss Alice M. Moylan, Miss Edith Bucknell, and Edmund Kalenski.

# British Dairy Farmers' Association.

## MEDAL SCHEME.

### Special Prizes at Educational Institutions and Country Shows.

The Council of the British Dairy Farmers' Association is prepared to consider applications from Educational Centres and Approved Societies in the United Kingdom for their Silver and Bronze Medals to be awarded in connection with dairying and dairy farming under the following conditions, viz. :—

1. All applications must be made on the official form and must clearly state the object for which the Medal or Medals are required.
2. Only one application from any Institution or Society can be considered in any one year.
3. The application must be repeated annually if Medals are again required.
4. A copy of the Proposed Prize List, showing the Conditions of the Award of the Medal and the name of the judge, should accompany the application, and the offer of a Medal cannot be confirmed until the Prize List has been approved.
5. The British Dairy Farmers' Association stipulates that no entry fee shall be charged in respect of these Medals, they being offered as *Special Extra Prizes*.
6. Notification of the award, with the winner's full name and address, to be forwarded to the Secretary, British Dairy Farmers' Association, 28, Russell Square, London, W.C., within 14 days of the award being made.
7. A person may not receive more than one Medal under this Scheme for the same subject or exhibit during any one year.

In the event of any dispute as to the interpretation of these Rules, the Council of the British Dairy Farmers' Association reserve full power of decision, and in the event of the Medal not being awarded in accordance with the above Rules and Conditions, the Council reserve the right to withhold the Medal altogether.

By Order of the Council,

FREDERICK E. HARDCASTLE,

*Secretary.*



# **AWARDS DURING 1914.**

Name of Society.	Show or Examination held at	Date.	Medal.	Winner and Object.
Leicestershire Agricultural Society	... Coalville ...	May 27 & 28	Silver	H. Neesham, for Dairy Cow "Canwick Fillpail 4th."
Devon County Agricultural Association	... Totnes ...	19-21	"	W. & H. Whitley, for Dairy Cow "Princess 3rd."
Yealmpton Agricultural Association	... Yealmpton ...	June 3...	"	Mrs. R. H. Barratt, for Cream.
Suffolk Agricultural Association	... Bury St. Edmunds	4 & 5 ...	"	Miss M. Hille, for Buttermaking.
Herefordshire and Worcestershire Agricultural Society	... Malvern ...	9 & 11	"	R. W. Hobbs & Sons, for Shorthorn Dairy Cow "Rose 43rd."
Essex Agricultural Society	... Waltham Abbey	10 & 11	"	J. T. Poulter, for Dairy Cow.
Staffordshire Agricultural Society	... Lichfield ...	10 & 11	"	Mrs. W. H. Basford, for Butter.
Cambridgeshire and Isle of Ely Agricultural Society	... Ely ...	July 14	"	Lord Rothschild, for Dairy Shorthorn Heifer, "Pretty Lass."
Sussex County Agricultural Society	... Eastbourne ...	15 & 16	"	G. L. M. Lutwyche, for Dairy Cow "Kethlenda."
Welsh National Agricultural Society	... Newport ...	21-23	"	F. W. Goad, for Buttermaking.
Yorkshire Agricultural Society	... Bradford ...	22-24	"	Miss Mary S. Mudd, for Buttermaking.
Hertfordshire Agricultural Society	... Hatfield ...	30	"	Lord Desborough, for Shorthorn Dairy Cow "Ashlyn's Amice."
Moretonhampstead Agricultural Association	... Moreton-Hampstead	30	"	J. D. Hooper, for Dairy Cow "Dairymaid."
Welbeck Tenants' Agricultural Society	... Welbeck ...	Aug. 3	"	W. Roberts, for Dairy Cow "Dairymaid 2nd."

*B. D. F. A. Medal Scheme.*

## AWARDS.—Continued.

Name of Society.	Show or Examination held at	Date.	Medal.	Winner and Object.
Tring Agricultural Society ... ..	Tring ... ..	Aug. 6 ...	Silver	Lord Lucas, for Shorthorn Dairy Cow "Primrose Gift."
Harrogate Agricultural Society ... ..	Harrogate ... ..	" 6 ...	"	C. Ruddock, for Dairy Cow "Bessie."
Aird and Strathglass Agricultural and Horticultural Association	Beaully ... ..	" 6 ...	Bronze	D. Macdonald, for Buttermaking.
Penistone Agricultural Society ... ..	Penistone ... ..	" 20 ...	Silver	T. Wearmouth, for Dairy Cow "Tankersley Dairy-maid."
Cheshire Dairy Farmers' Association ... ..	Chester ... ..	Oct. 6 & 7 ...	"	E. Jones, for Cheshire Cheese.
Gloucestershire Education Committee ... ..	Gloucester ... ..	Nov. 9 ...	"	Miss E. M. Lewis, for Dairy Produce.
Gloucestershire Root, Fruit and Grain Society	" ... ..	" 9 ...	"	James Clark, for Butter.
Whitchurch Dairy Farmers' Association ... ..	Whitchurch ... ..	" 24 & 25 ...	"	H. Jackson, for Cheshire Cheese.
" " " "	" ... ..	" 24 & 25 ...	Bronze	Miss Oxenham, for Butter.
Monmouthshire Agricultural Education Committee	Newport ... ..	Dec. 14 ...	Silver	F. J. Watkins, for Best Dairy Student in Young Farmers' Classes.

## AWARD OF PRIZES, DAIRY SHOW, 1914.

### DAIRY COWS AND HEIFERS IN MILK.

- Class 1—SHORTHORN Cows.**—Entered in or eligible for Coates' Herd Book, or its pedigree sent for such entry previous to the Show.—*First Inspection Prize* (£10) to Samuel Sanday, Puddington Hall, near Chester, for "Janetta." *Second Inspection Prize* (£5), *First Milking Trial Prize* (£20), Shorthorn Society's Prize (£10), Spencer Cup and Shirley Cup, to Robert W. Hobbs and Sons, Kelmscott, Lechlade, Glos, for "Rose 44th." *Third Inspection Prize* (£3) to Robert W. Hobbs & Sons for "Melody 13th." *Second Milking Trial Prize* (£10) to J. Moffat, Watercrock, near Kendal, for "Daisy Bella 9th." *Third Milking Trial Prize* (£5) to Lord Rothschild, Tring Park, Tring, for "Primrose 3rd."
- Class 2—SHORTHORN HEIFERS**, not exceeding three years of age.—Entered in or eligible for Coates' Herd Book.—*First Inspection Prize* (£5) to Lord Rothschild for "Prospect." *Second Inspection Prize* (£3) and *Third Milking Trial Prize* (£2) to J. Moffat for "Roan Sister 2nd." *Third Inspection Prize* (£2) and *First Milking Trial Prize* (£7) to Robert W. Hobbs & Sons for "Sybil 18th." *Second Milking Trial Prize* (£4) to Samuel Sanday for "Barrington Welcome 2nd."
- Class 3—SHORTHORN Cows.**—Not eligible for Class 1.—*First Inspection Prize* (£10) to Lord Lucas, Wrest Park, Ampthill, for "Sylvia." *Second Inspection Prize* (£5) and *Second Milking Trial Prize* (£10) to J. W. Astley, Southfield, West Marton, Skipton, for "Southfield Edna." *Third Inspection Prize* (£3) to A. Stansfield, The Calliards, Smithy Bridge, near Rochdale, for "Lady Cragg Vale." *First Milking Trial Prize* (£20) to Sam S. Rainhill, The Grange, Ringway, Altrincham, for "Liberty." *Third Milking Trial Prize* (£5) to Sam S. Rainhill for "Ruby."
- Class 4—SHORTHORN HEIFERS**, not exceeding three years of age.—Not eligible for Class 2.—*First Inspection Prize* (£5) to Geo. B. Nelson & Sons, Cockerham Hall, near Garstang, for "Rose." *Second Inspection Prize* (£3) to J. W. Astley for "Southfield Ruby." *Third Inspection Prize* (£2) to Robert W. Hobbs & Sons for "Althea." *First Milking Trial Prize* (£7) to J. W. Astley for "Southfield Vivien." *Second Milking Trial Prize* (£4) to James Sheppy, Redlynch Park, Chewton Keynsham, for "Model Maid 3rd." *Third Milking Trial Prize* (£2) to J. L. Shirley, Silvertown, Bletchley, for "Silvertown Daisy."
- Class 5—LINCOLNSHIRE RED SHORTHORN Cows.**—Entered in or eligible for the Herd Book of the Lincolnshire Red Shorthorn Association.—*First Inspection Prize* (£10) and *First Milking Trial Prize* (£20) to Stanley Blundell, Bendish, Welwyn, for "Bendish Charm." *Second Inspection Prize* (£5) to John Evens, Burton, Lincoln, for "Burton Pride 12th." *Third Inspection Prize* (£3) and *Second Milking Trial Prize* (£10) to John Evens for "Burton Spotted 10th."
- Class 6—LINCOLNSHIRE RED SHORTHORN HEIFERS**, not exceeding three years of age.—Entered in or eligible for the Herd Book of the Lincolnshire Red Shorthorn Association.—*First Inspection Prize* (£5) to John Evens for "Burton Rose 14th." *Second Inspection Prize* (£3) and *First Milking Trial Prize* (£7) to John Evens for "Burton Ruby Spot 11th." *Third Inspection Prize* (£2) to Chas. E. Scorer, White Hall, Bracebridge Heath, Lincoln, for "Sudbrook No. 33 C." *Second Milking Trial Prize* (£4) to John Evens for "Burton Daisy 3rd."
- Class 7—JERSEY Cows.**—Entered in or eligible for the Herd Book.—*First Inspection Prize* (£7) to A. Miller-Hallett, Goddington, Chelsfield, for "My Pallas." *Second Inspection Prize* (£4) and Blythwood Bowl to J. H. Smith-Barry, Stowell Park, Wilts, for "Last of the Lilies." *Third Inspection Prize* (£2) and *Third Milking Trial Prize* (£5) to J. H. Smith-Barry for "Marionette."

*First Milking Trial Prize (£15) to J. H. Smith-Barry for "Heywood Bluebell."*  
*Second Milking Trial Prize (£10) to J. Carson, Crystalbrook, Theydon Bois, for "Vigilance."*

**Class 8—JERSEY HEIFERS**, not exceeding three years of age.—Bred in Great Britain or Ireland.—Entered in or eligible for the Herd Book.—*First Prize (£7) to J. H. Smith-Barry for "Shellduck."* *Second Prize (£4) to J. Carson for "Campaniles Sultana."*

**Class 9—JERSEY HEIFERS**, not exceeding three years of age.—Bred in Channel Islands.—Entered in or eligible for the Jersey or English Jersey Herd Book.—*First Prize (£7) to J. Carson for "Erithrea."*

**Class 10—GUERNSEY COWS**.—Entered in or eligible for the Herd Book.—*First Inspection Prize (£7) to Frank Pratt-Barlow, Lynchmere House, Lynchmere, for "Citron Blossom 25th."* *Second Inspection Prize (£4) to J. F. Remnant, M.P., The Grange, Hare Hatch, Twyford, for "Treacle 3rd."* *First Milking Trial Prize (£15) to A. W. Bailey Hawkins, Stagenhoe Park, Welwyn, for "Merton Dairymaid 5th."* *Second Milking Trial Prize (£10) to F. H. Norman, Moor Place, Much Hadham, for "Goldstream 5th."*

**Class 11—GUERNSEY HEIFERS**, not exceeding three years of age.—Entered in or eligible for the Herd Book.—*First Prize (£7) to Sir H. F. Lennard, Bart., Wickham Court, West Wickham, Kent, for "Donnington Jill 2nd."*

**Class 12—RED POLL COWS**.—Entered in or eligible for the Herd Book.—*First Inspection Prize (£7), Second Milking Trial Prize (£10), and Equal for the Red Poll Cattle Society's Prize (£5) to Kenneth M. Clark, Sudbourne Hall, Orford, Suffolk, for "Sudbourne Flight" (22359).* *Second Inspection Prize (£4), First Milking Trial Prize (£15), Lord Mayor's Cup, Barham Cup and Equal for the Red Poll Cattle Society's Prize (£5) to Kenneth M. Clark for "Sudbourne Minnie" (22850).* *Third Milking Trial Prize (£5) to Kenneth M. Clark for "Sudbourne Queen 1st" (20122).*

**Class 13—RED POLL HEIFERS**, not exceeding three years of age.—Entered in or eligible for the Herd Book.—*First Inspection Prize (£5) and Red Poll Cattle Society's Prize (£5) to Kenneth M. Clark for "Sudbourne Berry 1st" (23790).* *Second Inspection Prize (£3) to A. Carlyle Smith, Sutton Hall, Woodbridge, for "Ashmoor Matron" (23391).* *Third Inspection Prize (£2) to A. Carlyle Smith for "Ashmoor Sunshine" (23395).* *First Milking Trial Prize (£5) to Kenneth M. Clark for "Sudbourne Moonshine" (23323).* *Second Milking Trial Prize (£3) to Leake & Longe, Harefield Park, Harefield, for "Kettleburgh Rosie 4th."* *Third Milking Trial Prize (£2) to Leake & Longe for "Kettleburgh Rosie 2nd C" (23575).*

**Class 14—AYRSHIRE COWS**.—Cancelled.

**Class 15—SOUTH DEVON COWS**.—Entered in or eligible for the Herd Book.—*First Inspection Prize (£7) to Robert Cundy, Benbow Street, Devonport, for "Carnation."* *Second Inspection Prize (£4) and Second Milking Trial Prize (£10) to W. & H. Whitley, Primley Farm, Paignton, for "Mayflower 28th" (5922).* *First Milking Trial Prize (£15) to Page & Whitley, Warren Hall, Broughton, near Chester, for "Hilda 3rd" (7041).* *Third Milking Trial Prize (£5) to Page & Whitley for "Cherry 5th" (7005).*

**Class 16—KERRY COWS**.—Cancelled.

**Class 17—DEXTER COWS**.—Cancelled.

**Class 18—BRITISH HOLSTEIN COW**.—Entered in or eligible for the Herd Book.—*First Inspection Prize (£7) to A. & J. Brown, Hedges Farm, St. Albans, for "Park Buttercup" (3086).* *Second Inspection Prize (£4) to Alfred G. Nye, Well Place, Penhurst, Kent, for "Waltham Plum" (5104).* *Third Inspection Prize (£2) to Mrs. Townshend, Gorstage Hall, Sandiway, Cheshire, for "Gorstage Guelder."*

**Class 19—PAIR OF COWS OF ANY BREED OR CROSS (in milk)**.—*First Prize (£20) to W. B. Withers, Lower Court Farm, Long Ashton, Bristol, for "Cowley"*

and "Prettypaid" (Shorthorns). *Second Prize* (£15) to J. Moffat for "Marion" and "Daisy" (Shorthorns). *Third Prize* (£10) to John Littleton, Arkleby Hall Farm, Aspatria, for "Polly" and "Maggie" (Shorthorns). *Fourth Prize* (£5) to Thos. Morley, Gallants Farm, Whetstone, Middlesex, for "Rose" and "Dairymaid" (Shorthorns). *Fifth Prize* (£3) to Geo. B. Nelson & Sons for "Fanny" and "Lilly."

**Class 20.—SINGLE COW OF ANY BREED OR CROSSES (in milk).—***First Prize* (£10) to Robert W. Hobbs & Sons, for "Lady Alexandra" (Shorthorn). *Second Prize* (£7) to T. E. Clarke, Harwood, near Bolton for "Nellie." *Third Prize* (£5) to Sam S. Raingill, for "Mabel" (Shorthorn). *Fourth Prize* (£3) to Lady Thursby, Ormerod House, Burnley, for "Lady Mansy" (Shorthorn). *Fifth Prize* (£2) to J. Moffat, for "Filpail" (Shorthorn).

The animals in Classes 18 and 19 were used in connection with the Milkers' Contests.

#### BUTTER TESTS.

**SHORTHORNS** entered in Classes 1, 2, 3, 4, 5, and 6.—*First Prize* (£5 and Silver Medal) and Nelson Cup to J. Moffat for "Daisy Bella 9th." *Second Prize* (£4 and Bronze Medal) to Sam S. Raingill for "Liberty." *Third Prize* (£3) to Samuel Sanday for "Janetta." *Fourth Prize* (£2) to F. H. Thornton, Kingthorpe Hall, Northampton, for "Somerford Flower 2nd."

**JERSEYS** entered in Classes 7, 8, and 9, and eligible for the English Jersey Herd Book.—*First Prize* (Gold Medal or £10) to J. H. Smith-Barry for "Maionette." *Second Prize* (Silver Medal) to J. H. Smith-Barry for "Heywood Bluebell." *Third Prize* (Bronze Medal) to J. H. Smith-Barry for "Duckwing."

**ANY OTHER BREED** entered in Classes 10 to 18 inclusive.—Prizes of £3 each to A. W. Bailey Hawkins for "Merton Dairymaid 5th" (Guernsey); Page and Whitley for "Hilda 3rd" (South Devon). Prize of £1 to W. & H. Whitley for "Mayflower 28th" (South Devon).

#### BULLS.

**Class 21.—SHORTHORN BULLS**, above one year and not exceeding three years old.—Entered in or eligible for the Herd Book.—*First Prize* (£20) to Robert Heath, Biddulph Grange, Biddulph, Staffs., for "Puddington Rosador." *Second Prize* (£10) to E. S. Godsell, Salmon's House, Stroud, Glos., for "Salmon's Premier." *Third Prize* (£5) to Weston P. Parsons, Manor Farm, Charlton Horethorne, Som., for "Handsome Lad" (115,759). *Fourth Prize* (£3) to Capt. A. S. Wills, Thornby Hall, Northampton, for "Thornby Ringer."

**Class 22.—JERSEY BULLS**, above one year and not exceeding three years.—Entered in or eligible for the Herd Book.—*First Prize* (£10) to J. Carson for "Combination Knight."

**Class 23.—BULLS OF ANY OTHER PURE BREED**, above one year and not exceeding three years old.—Entered in or eligible for the Herd Book.—*Silver Medal* to W. & H. Whitley for "Primley General" (5,034) (South Devon). Kenneth M. Clark for "Sudbourne King" (Red Poll).

#### BREEDERS' PRIZES.

**SILVER MEDAL TO EACH FIRST PRIZE COW, HEIFER, OR BULL IN THE SHOW.**—To Samuel Sanday for Shorthorn Cow "Janetta"; R. W. Hobbs & Sons for Shorthorn Cow "Rose 44th"; Lord Rothschild for Shorthorn Heifer "Prospect"; R. W. Hobbs & Sons for Shorthorn Heifer "Sybil 18th"; Mr. Moore for Shorthorn Cow "Sylvia"; G. B. Nelson for Shorthorn Heifer "Rose"; J. W. Astley for Shorthorn Heifer "Southfield Vivien"; Stanley Blundell for Lincolnshire Red Shorthorn Cow "Bendish Charm"; John Evens for Lincolnshire Red Shorthorn Heifers "Burton Ruby Spot 11th" and "Burton Rose 14th"; C. Fossey for Jersey Cow "My Pallas"; Lord Ludlow for Jersey Cow "Heywood Bluebell"; J. H. Smith-Barry for Jersey Heifer "Shelduck"; F. Desmares for Jersey Heifer

"Erithrea"; Mrs. C. H. Stephens for Guernsey Cow "Citron Blossom 25th"; W. J. Empson for Guernsey Cow "Merton Dairymaid 5th"; A. C. Harris for Guernsey Heifer "Donnington Jill 2nd"; Kenneth M. Clark for Red Poll Cows "Sudbourne Flight" and "Sudbourne Minnie," and for Red Poll Heifers "Sudbourne Berry 1st" and "Sudbourne Moonshine"; S. Cox for South Devon Cow "Hilda 3rd"; Thomas Cundy for South Devon Cow "Carnation"; W. Forster for Shorthorn Cow "Lady Alexandra"; Samuel Sanday for Shorthorn Bull "Puddington Rosador"; J. Carson for Jersey Bull "Combination Knight."

#### SHE-GOATS.

- Class 24—MILKING COMPETITION FOR GOATS (any Variety).**—*First Prize* (Silver Medal and £2 10s., and the Baroness Burdett-Coutts Challenge Cup), to M. E. Mitchell, Grange House, Levenshulme, Manchester, for "Hawthorne Granite." *Second Prize* (£1 10s.) to Herbert E. Hughes, The Bungalow, Broxbourne, for "Broxbourne Fairy Queen." *Third Prize* (£1) to Mrs. J. C. Straker, The Leazes, Hexham, for "Halton Hairbell." *Fourth Prize* (10s.) to Miss Vera Flood Page, Westwood, Normandy, Guildford, for "Cophthorne Almond."
- Class 25—SHE-GOATS OF ANY VARIETY** that have won two or more *First Prizes* in Classes other than for Kids or Goatlings, on or before September 4th, 1914.—*First Prize* (£2) to Mrs. J. C. Straker for "Leazes Lupin."
- Class 26—SHE-GOATS, SWISS OR ANGLO-SWISS**, being any Sho-Goat bred from English and any recognised breed or breeds of Swiss Goats without any admixture of Anglo-Nubian or other blood for at least six generations on both sides (over two years), not eligible for Class 25.—*First Prize* (£2) to Herbert E. Hughes for "Broxbourne March Maiden."
- Class 27—SHE-GOATS, ANGLO-NUBIAN**, being any Goat entered in the Anglo-Nubian Section of the Herd Book, or eligible for entry therein (over two years), not eligible for Class 25.—*First Prize* (£2) to Miss Vera Flood Page for "Wigmore Tare." *Second Prize* (£1) to Mrs. Reginald Pease, Sadberge Hall, Middleton St. George, for "Sadberge Stork." *Third Prize* (10s.) to R. P. Peake, Great Gardens Farm, Romford, for "Fenchurch Hyacinth."
- Class 28—SHE-GOATS, ANY OTHER VARIETY.**—Not eligible for previous classes. Over two years on October 1st, 1914.—*First Prize* (£2) to M. E. Mitchell for "Hawthorne Granite." *Second Prize* (£1) to Mrs. Reginald Pease, for "Sadberge Swift." *Third Prize* (10s.) to Mrs. J. C. Straker for "Leazes Libertine."
- Class 29—GOATLINGS, SWISS OR ANGLO-SWISS**, being any Goatling bred from English and any recognised breed or breeds of Swiss Goats without any admixture of Anglo-Nubian or other blood for at least six generations on both sides (over one but not over two years).—Cancelled.
- Class 30—GOATLINGS, ANGLO-NUBIAN**, being any Goatling entered in the Anglo-Nubian Section of the Herd Book, or eligible for entry therein (over one but not over two years).—*First Prize* (£2) to Mrs. C. J. Billson, The Priory, Martyn Worthy, near Winchester for "Wild Locust." *Second Prize* (£1) to Mrs. Reginald Pease for "Sadberge Pigeon." *Third Prize* (10s.) to Mrs. C. J. Billson for "Forest Nymph."
- Class 31—GOATLINGS, ANY OTHER VARIETY** (over one but not over two years), not qualified for Classes 29 or 30.—*First Prize* (£2) to Miss L. le Patourel, Edenstead, Crosby-on-Eden, for "Wigmore Clover." *Second Prize* (£1) to Mrs. J. C. Straker for "Leazes Lismore." *Third Prize* (10s.) to M. E. Mitchell for "Grange Daisy."
- Class 32—FEMALE KIDS, SWISS OR ANGLO-SWISS**, being any Kid bred from English and any recognised breed or breeds of Swiss Goats without any admixture of Anglo-Nubian or other blood for at least six generations on both sides (not over one year).—*First Prize* (£2) and *Bronze Medal* to Mrs. C. J. Billson for "Oadby Mummelle."

**Class 33—FEMALE KIDS, ANGLO-NUBIAN**, being any Kid entered in the Anglo-Nubian Section of the Herd Book, or eligible for entry therein (not over one year).—*First Prize* (£2) to Mrs. Reginald Pease for "Sadberge Chaffinch." *Second Prize* (£1) to Miss Masy D. Fort, The Elms, Speen, Newbury, Berks, for "Butterkin."

**Class 34—FEMALE KIDS, ANY OTHER VARIETY** (not over one year), not qualified for Classes 32 or 33.—*First Prize* (£2) to Miss Pope, Bashley Lodge, New Milton, for "Pride." *Second Prize* (£1) to Miss Pope for "Prejudice." *Third Prize* (10s.) to Mrs. Sydney E. D. Wilson, Ebchester Hill, Ebchester, Co. Durham for "Sedgemere Dimple."

### CHEESE.

(For Makers only, residing in any part of the United Kingdom.)

**Class 35—STILTON (6 Cheeses)**.—*First Prize* (£10) to Tuxford & Nephews, Melton Mowbray. *Second Prize* (£5) to Henry Morris, North Street, Melton Mowbray. *Third Prize* (£2) to Mrs. S. L. Carte, Japonica House, Hickling, Melton Mowbray.

**Class 36—STILTON (36 Cheeses)**.—*First Prize* (Silver Medal and £10) to Tuxford and Nephews. *Second Prize* (£5) to Henry Morris. *Third Prize* (£2) to Belvoir Vale Dairies, Harby, Melton Mowbray.

**Class 37—CHEDDAR TRUCKLES (6 Cheeses)**.—*First Prize* (£5) to W. C. Spencer, Manor Farm, Hillfield, Cattistock, Dorset. *Second Prize* (£3) to S. T. White, Forde Grange Dairy, Thornecombe, Chard. *Third Prize* (£2) to E. Brake, Bruton, Somerset.

**Class 38—CHEDDAR (4 Cheeses)**.—*First Prize* (£10) to W. H. E. Greenhill, Hilperton Marsh Farm, Trowbridge. *Second Prize* (£7) to J. W. Banwell, Home Farm, East Harptree, near Bristol. *Third Prize* (£5) to E. White, Double House, West Pennard, Glastonbury. *Fourth Prize* (£3) to W. C. Spencer. *Fifth Prize* (£2) to W. B. White, Lower Farm, Ansty, Dorchester.

**Class 39—CHEDDAR (20 Cheeses)**.—*First Prize* (Silver Medal and £10) to E. Brake. *Second Prize* (£7) to Joseph Burfitt, Goodedge Farm, North Bruham, Bruton, Somerset. *Third Prize* (£5) to E. E. Hoddinott, Manor Court Farm, Trowle, Trowbridge. *Fourth Prize* (£3) to W. C. Spencer. *Fifth Prize* (£2) to Frank Portch, Whitcombe, Corton Denham, Sherborne, Dorset.

**Class 40—CHESHIRE (20 Cheeses)**.—*First Prize* (Silver Medal and £10) to W. E. Moore, Baddiley Farm, Nantwich. *Second Prize* (£5) to C. E. Parton, Haughton Hall Farm, Tarporley. *Third Prize* (£3) to F. A. Moore, The Grange, Checkley, Nantwich. *Fourth Prize* (£2) to W. H. Hobson, Gonsley Farm, Blakenhall, Nantwich.

**Class 41—CHESHIRE (4 Coloured Cheeses, not less than 40 lbs. each)**.—*First Prize* (£10) and Sir Gilbert Greenall Champion Cup, to C. E. Parton. *Second Prize* (£5) to W. H. Hobson. *Third Prize* (£2) to John Sumner, Lower Farm, Whitgreave, near Stone, Staffs.

**Class 42—CHESHIRE (4 Uncoloured Cheeses, not less than 40 lbs. each)**.—*First Prize* (£10) to J. Bibby & Sons, Hall-o'-Coole, Nantwich. *Second Prize* (£5) to William Hampson, Whitgreave, near Stone, Staffs. *Third Prize* (£2) to Newhall Farmers' Dairies, Ltd., Aston, near Nantwich.

**Class 43—LEICESTER (4 Cheeses)**.—*First Prize* (£5) and the Lord Mayor's Cup to Mrs. A. M. E. Bowmer, The Hays, Barrow-on-Soar, Leicestershire. *Second Prize* (£3) to F. W. Tomlinson, The Home Farm, Ashby Parva, Lutterworth.

**Class 44—LANCASHIRE (4 Cheeses)**.—*First Prize* (£5) to George Whitaker, Gibson's Farm, Kirkland, Garstang. *Second Prize* (£3) to T. Hesketh, Greenlands Farm, Nateby, near Garstang. *Third Prize* (£2) to William Kirby, Catforth Hall, near Preston.

**Class 45—DERBY (4 Uncoloured Cheeses, not less than 25 lbs. each)**.—*First Prize* (£5) to T. Bould, Ellastone, Ashbourne. *Second Prize* (£3) to Mrs. C. A. Goodwin, Aston Hill Farm, Stone, Staffs. *Third Prize* (£2) to Brailsford and District Dairy Farmers' Association, Brailsford.

- Class 46—DOUBLE GLOSTER** (4 Cheeses, from 26 lbs. to 30 lbs. each, total weight not to exceed 120 lbs.).—*First Prize* (£5) to Arthur Warren, Symes Dairy, North Perrott, Crewkerne. *Second Prize* (£3) to Cheddar Valley Dairy Co., Ltd., Axbridge, Somerset. *Third Prize* (£2) to Miss E. M. Lewis, King's Hill, Berkeley, Glos.
- Class 47—SINGLE GLOSTER** (4 Cheeses, from 13 lbs. to 15 lbs. each, total weight not to exceed 60 lbs.).—*First Prize* (£5) to Miss E. M. Lewis, King's Hill, Berkeley, Glos. *Second Prize* (£3) to Mrs. L. H. Shield, Alkington Farm, Berkeley, Glos.
- Class 48—CAERPHILLY** (4 Cheeses, not exceeding 8 lbs. each).—*First Prize* (£5) to Wilts United Dairies, Ltd., Wells, Somerset. *Second Prize* (£3) to G. Burrow, Cedar Tree Farm, Badgworth, Axbridge, Somerset.
- Class 49—WENSLEYDALE** (Blue Moulded, 6 Cheeses).—*First Prize* (£5) to Alfred Rowntree, The Dairy, Coverham, Middleham. *Second Prize* (£3) to Alfred Rowntree, The Dairy, Masham, Yorks.
- Class 50—CREAM CHEESE** (made from pure cream only; no milk or curd to be added; 6 Cheeses).—*First Prize* (£2) to Charles Prideaux, The Grange, Motcombe, Dorset. *Second Prize* (£1) to Mrs. W. Howard Palmer, Murrell Hill, Binfield, Berks. *Third Prize* (10s.) to East Anglian Institute of Agriculture, Chelmsford.
- Class 51—GERVAIS** (6 Cheeses).—*First Prize* (£1) to East Anglian Institute of Agriculture.
- Class 52—UNRIPENED SORT CHEESE** (other than Cream Cheese or Gervais, made direct from milk; 4 Cheeses).—*First Prize* (£1) to Mrs. C. A. Simmons, Peck, Moretonhampstead, Devqn. *Second Prize* (10s.) to Miss M. E. Poole, Sawkins Farm, Baddow Road, Chelmsford.

#### COLONIAL CHEESE. (Open to Makers only.)

- Class 53—CHEDDAR** (Coloured or Uncoloured; 4 Cheeses, not less than 60 lbs. each).—*First Prize* (Silver Medal and £5) to Hawera Co-operative Dairy Factory Co., Ltd., Hawera, Taranaki, New Zealand. *Second Prize* (Bronze Medal and £3) to Mangamarama Co-operative Cheese Factory, Mangatainoka, Wellington, New Zealand. *Third Prize* (£2) to Mataura Co-operative Cheese Factory, Mataura, Southland, New Zealand.

#### COLLECTIONS OF DAIRY PRODUCE.

- Class 54—COLLECTION OF BRITISH DAIRY PRODUCE.**—(No Entry).
- Class 55—COLLECTION OF COLONIAL DAIRY PRODUCE.**—(No Entry.)

#### BACON AND HAMS.

(Open to Curers only, residing in any part of the United Kingdom.)  
(Classes 60 and 65 excepted.)

- Class 56—PALE DRIED BACON** (4 hamless sides of spring or winter cure).—*First Prize* (Silver Medal) to Joseph Smith, Cummersdale, near Carlisle. *Second Prize* (Bronze Medal) to Joseph Smith.
- Class 57—SMOKED BACON** (4 sides, mild cured in Wiltshire style, with ham attached).—*First Prize* (Silver Medal) to Colin & Co., Ltd., Burton Street, Melton Mowbray. *Second Prize* (Bronze Medal) to Herts and Beds Bacon Factory, Ltd., Hitchin.
- Class 58—PALE DRIED BACON** (4 sides, mild cured in Wiltshire style, with ham attached).—*First Prize* (Silver Medal) to Herts and Beds Bacon Factory, Ltd. *Second Prize* (Bronze Medal) to Colin & Co., Ltd.
- Class 59—Open to Curers only in the United Kingdom.**  
(One entry to consist of Two Sides of Bacon Smoked, and Two Sides of Bacon Pale Dried, and Two Hams Smoked, Two Hams Pale Dried. The



weight of the sides not less than 56 lbs., and not more than 68 lbs. each. The hams not less than 12 lbs. and not more than 20 lbs. each.)

*First Prize* (£10 10s.) to Herts and Beds Bacon Factory, Ltd. *Second Prize* (£5 5s.) to M. Venner & Sons, Reading.

**Class 60.**—Open to Curers only in the British Colonies and British Protectorates. The curing to be done in the Exhibitor's own premises, but the drying and smoking may be done in the United Kingdom under a certificate from a duly accredited representative of the Government concerned.

(One entry to consist of Two Sides of Bacon Smoked, Two Sides of Bacon Pale Dried and Two Hams Smoked, Two Hams Pale Dried. The weight of the sides not less than 56 lbs. and not more than 68 lbs. each. The hams not less than 12 lbs. and not more than 20 lbs. each.)

(No award—all entries absent.)

**THE BRITISH EMPIRE TROPHY**, consisting of the British Dairy Farmers' Association's Gold Medal and £5 5s., offered for entries in Classes 59 and 60, awarded to Herts and Beds Bacon Factory, Ltd.

**Class 61.**—PALE DRIED HAMS (4 hams, long cut, of winter or spring cure, not over 14 lbs. weight).—*First Prize* (Silver Medal) to Palethorpes, Ltd., Dudley Port, Staffs. *Second Prize* (Bronze Medal) to Joseph Smith.

**Class 62.**—PALE DRIED HAMS (4 hams, long cut, of winter or spring cure, over 14 lbs. weight).—*First Prize* (Silver Medal) to Palethorpes, Ltd. *Second Prize* (Bronze Medal) to Joseph Smith.

**Class 63.**—SMOKED HAMS (4 hams, long cut, mild cured, not over 10 weeks cured, not over 15 lbs. weight).—*First Prize* (Silver Medal) to Palethorpes, Ltd. *Second Prize* (Bronze Medal) to Joseph Smith.

**Class 64.**—PALE DRIED HAMS (4 hams, long cut, mild cured, not over 10 weeks cured, over 15 lbs. weight).—*First Prize* (Silver Medal) to Herts and Beds Bacon Factory, Ltd. *Second Prize* (Bronze Medal) to Walker & Son (Leicester), Ltd., 4, Cheapside, Leicester.

**Class 65.**—SMOKED HAMS (4 hams, cured in Ireland, under 14 lbs. weight).—(No Entry.)

**Class 66.**—TWO HAMS (cured in the farmhouse or home; professional bacon curers not eligible).—*First Prize* (£2) to Thomas Welsby, Rhyd Alyn, Mold, North Wales. *Second Prize* (£1) to Thomas Welsby.

**Class 67.**—SELLING CLASS FOR HAMS (any variety) (2 hams).—*First Prize* (£2) to Joseph Smith. *Second Prize* (£1) to Joseph Smith.

## BUTTER.

(Open to Makers only, residing in any part of the United Kingdom.)

**Class 68.**—BUTTER, slightly Salted. (Open only to farmers, their wives, sons, and daughters, occupying not exceeding 100 acres, and who have never won a Prize in the Butter Classes at any of the Society's Shows. 2 lbs. in 1-lb. lumps).—*First Prize* (£3) to Arthur J. Mildon, Rackenford, Devon. *Second Prize* (£2) to T. Hern, Oakley, Horrabridge, Devon. *Third Prize* (£1) to Miss Beatrice Northcott, Holmbush, St. Austell, Cornwall.

**Class 69.**—BUTTER (Champion Class).—(Open to First Prize Winners of the previous two years only. Competitors in this class not eligible to compete in any other Butter Class at this Dairy Show). 2 lbs. in 1-lb. lumps.—*First Prize* (Gold Medal) to Mrs. Maurice Bullock, Bodieve, Wadebridge, Cornwall. *Second Prize* (Silver Medal) to Mrs. John Way, West Bridge, Bishop's Nympton, South Molton.

Winners of the Gold Medal in the above class will not be eligible to compete in the Butter Classes at the Dairy Show again.

First Prize Winners at the two previous Dairy Shows are not eligible to compete in Classes 70 to 76 inclusive.

- Class 70**—**BUTTER**, perfectly free from Salt, the produce of Channel Islands Cattle and their Crosses. 2 lbs. in 1-lb. lumps.—Three *Equal First Prizes* (£3 each) to J. Peek, Quarry Farm, Whitchurch, Tavistock; Lord Portman, Bryanston, Blandford; Miss Beatrice Northcott. Three *Equal Second Prizes* (£2 each) to Mrs. Priestly, Little Missenden Abbey, Great Missenden; Mrs. W. Howard Palmer, Murrell Hill, Binfield; Miss E. Everest, Chippens Bank, Hevor, Kent. Three *Equal Third Prizes* (£1 each) to T. Hern; Mrs. R. Clarke, Springfield Farm, Norley, near Warrington; Mrs. Whitlock, Fairthorne Dairy, Botley, Hants.
- Class 71**—**BUTTER**, slightly salted, the produce of Channel Islands Cattle and their Crosses. 2 lbs. in 1-lb. lumps.—Three *Equal First Prizes* (£3 each) to Lord Portman; Mrs. J. M. Martin, Lansenwith, Stythians, Cornwall; Miss Beatrice Northcott. Three *Equal Second Prizes* (£2 each) to J. Peek; T. Hern; Miss E. Everest. Three *Equal Third Prizes* (£1 each) to Arthur J. Mildon; Mrs. R. Clarke, Mrs. W. Howard Palmer.
- Class 72**—**BUTTER**, perfectly free from Salt, the produce of Shorthorn and other Cattle and their Crosses (except Channel Islands and their Crosses). 2 lbs. in 1-lb. lumps.—Three *Equal First Prizes* (£3 each) to Arthur J. Mildon, Lord Portman; Mrs. Burnard, Hoppatow, Pyworthy, Holsworthy, Devon. Three *Equal Second Prizes* (£2 each) to J. Peek; T. Hern; Mrs. Monteith, Island Farm, Bothkennar, Stirlingshire. Three *Equal Third Prizes* (£1 each) to Mrs. Bertha Miles, Holwell, Sherborne; Miss Mary A. Dalrymple, Elliston, St. Boswells, N.B.; G. C. Ellis, Worston, Yealmpton, Plymouth.
- Class 73**—**BUTTER**, slightly Salted, the produce of Shorthorn and other Cattle and their Crosses (except Channel Islands and their Crosses). 2 lbs. in 1-lb. lumps.—Three *Equal First Prizes* (£3 each) to J. Peek; Mrs. Burnard; G. C. Ellis. Three *Equal Second Prizes* (£2 each) to T. Hern; Miss Edith Mead, Corringdon Farm, South Brent, Devon; Mrs. C. Saunders, Neadon, Moretonhampstead, Devon. Three *Equal Third Prizes* (£1 each) to Arthur J. Mildon; Lord Portman; Mrs. J. Gray, Folly Farm, Kington Magna, Gillingham, Dorset.
- Class 74**—**BUTTER**, slightly Salted. 2 lbs. in 1-lb. lumps.—Two *Equal First Prizes* (£3 each) to Lord Portman; Mrs. Burnard. Two *Equal Second Prizes* (£2 each) to J. Peek; T. Hern. Two *Equal Third Prizes* (£1 each) to Miss E. Everest; Miss S. M. Corbett, Stableford, Bridgnorth.
- Class 75**—**BUTTER**, free from Salt or slightly Salted, at the discretion of the Exhibitor, to be made from Scalded Cream only. 2 lbs. in 1-lb. lumps.—*First Prize* (£3) to Miss Beatrice Northcott. *Second Prize* (£2) to J. Peek. *Third Prize* (£1) to Miss G. B. Tuckett, Penquite, Par Station, Cornwall.
- Class 76**—**BUTTER**, free from Salt, 2 lbs. in oblong pounds or bricks, shaped with Scotch hands, but without decoration or printing on top of pounds.—*First Prize* (£3) to Miss Mary A. Dalrymple. *Second Prize* (£2) to Miss Beatrice Northcott. *Third Prize* (£1) to Miss F. Irving, Wood Side Farm, Heads Nook, Carlisle.
- Class 77**—**BUTTER**, made up in the most marketable design, to be packed and sent by parcels post and opened in the presence of the judge. Quality and packing to be considered in making the awards. 1 lb.—*First Prize* (£2) to Lord Portman. *Second Prize* (£1) to Miss F. Irving. *Third Prize* (10s.) to Miss G. B. Tuckett.
- Class 78**—**BUTTER**, free from Salt, in 24-lb. boxes of 12 rolls. Packages (non-returnable) to be taken into consideration. The Rolls not to be separately wrapped.—*First Prize* (£5) to Ballymote Co-operative Agricultural and Dairy Society, Ltd., Ballymote, Co. Sligo. *Second Prize* (£3) to Granagh Co-operative Dairy Society, Ltd., Ballingarry, Co. Limerick. *Third Prize* (£2) to Doons Co-operative Agricultural and Dairy Society, Ltd., Doons, Cookstown, Ireland. *Fourth Prize* (£1) to Springfield Co-operative Dairy Society, Enniskillen, Co. Fermanagh.

**Class 79—MILD CURED BUTTER**, in boxes of 24 rolls of 1 lb. each, slightly Salted. Packages (non-returnable) to be taken into consideration. Wrapping allowed).—*First Prize* (£5) to Charles Prideaux, The Grange, Motcombe, Dorset. *Second Prize* (£3) to Ballymote Co-operative Agricultural and Dairy Society, Ltd. *Third Prize* (£2) to Granagh Co-operative Dairy Society, Ltd. *Fourth Prize* (£1) to Glenwilliam Co-operative Dairy Society, Ltd., Ballin-garry, Co. Limerick. *Fifth Prize* (10s.) to Springfield Co-operative Dairy Society.

**Class 80—CURED BUTTER**, not less than 28 lbs., slightly Salted. Packages (non-returnable) to be taken into consideration.—*First Prize* (£5) to Granagh Co-operative Dairy Society, Ltd. *Second Prize* (£3) to Ballymote Co-operative Agricultural and Dairy Society, Ltd. *Third Prize* (£2) to Ballyvistica Co-operative Dairy Society, Ltd., Emly, Co. Tipperary. *Fourth Prize* (£1) to Belleek Co-operative Dairy Society, Belleek, Co. Fermanagh. *Fifth Prize* (10s.) to Charles Prideaux.

**Class 81—CURED BUTTER**, 56 lbs. Packages (non-returnable) to be taken into consideration.—*First Prize* (£5) to Ballymote Co-operative Agricultural and Dairy Society, Ltd. *Second Prize* (£3) to Charles Prideaux. *Third Prize* (£2) to Ballyvistica Co-operative Dairy Society, Ltd. *Fourth Prize* (£1) to Granagh Co-operative Dairy Society, Ltd. *Fifth Prize* (10s.) to Belleek Co-operative Dairy Society.

**Class 82—FANCY OR ORNAMENTAL DESIGN IN BUTTER**, with foliage or other extraneous decoration.—*First Prize* (£3) to Miss H. M. Trenchard, Uphay Farm, Axminster, Devon. *Second Prize* (£2) to Miss Brown, Eastlands, Bradwell-on-Sea, Essex. *Third Prize* (£1) to Miss Edith Bush, The Rookery, Great Ellingham, Attleborough.

**Class 83—FANCY OR ORNAMENTAL DESIGN IN BUTTER** without extraneous decoration, adapted for table use.—*First Prize* (£3) to Miss H. M. Trenchard. *Second Prize* (£2) to Miss Brown. *Third Prize* (£1) to Mrs. J. A. Turnbull, Latterhead, Cockermouth, Cumberland.

**SPECIAL PRIZE GIVEN BY MESSRS. ELKINGTON & Co., LTD.**

Awarded for the best Exhibit in Classes 68, 70 to 77.—“Elkington” Cup (value £7) to Mrs. J. M. Martin, Lansenwith, Stythians, Cornwall. (Class 71, No. 746.)

#### COLONIAL BUTTER.

(OPEN TO MAKERS ONLY.)

**Class 84—AUSTRALIAN SALTED BUTTER**, one box containing not less than 56 lbs. —*First Prize* (Gold Medal) to Lismore Co-operative Dairy Co., Ltd., Corndale, New South Wales. *Second Prize* (Silver Medal) to Singleton Central Co-operative Dairy Co., Ltd., Singleton, New South Wales. *Third Prize* (Bronze Medal) to Gormandale Butter Factory, Victoria.

**Class 85—AUSTRALIAN UNSALTED BUTTER**, one box containing not less than 56 lbs.—*First Prize* (Gold Medal) to Swanpool and Moorngag Butter Factory Co., Victoria. *Second Prize* (Silver Medal) to Singleton Central Co-operative Dairy Co., Ltd. *Third Prize* (Bronze Medal) to Denman Co-operative Dairy Co., Ltd., Denman, New South Wales.

**Class 86—NEW ZEALAND SALTED BUTTER**, one box containing not less than 56 lbs.—Gold Medal to Pio Pio Co-operative Dairy Co., Ltd., Pio Pio, via Te Kuiti, North Island.

**Class 87—NEW ZEALAND UNSALTED BUTTER**, one box containing not less than 56 lbs.—Silver Medal to Pio Pio Co-operative Dairy Co., Ltd.

#### CREAM.

**Class 88—CLOTTED CREAM**, in vessels (filled) ready for sale.—*First Prize* (Silver Medal) to Mrs. W. R. Beer, Pill Farm Dairy, Barnstaple. *Second Prize* (Bronze Medal) to Miss E. Everest.

**Class 89—CREAM, OTHER THAN CLOTTED**, in vessels (filled) ready for sale.—*First Prize* (Silver Medal) to Mrs. W. Howard Palmer. *Second Prize* (Bronze Medal) to Thomas French, Crystal Palace Dairy, Norwood.

**SKIM-MILK BREAD AND SCONES.**

(Mixed with Skim Milk in lieu of Water.)

- Class 90—WHITE BREAD, 2 loaves, not exceeding 2 lbs. each.—*First Prize* (Silver Medal) to W. Jackson & Son, Ltd., Victoria Street, Hull. *Second Prize* (Bronze Medal) to Lawrence Witt, 34, Heath Road, Twickenham.
- Class 91—BROWN BREAD, 2 loaves, not exceeding 2 lbs. each.—*First Prize* (Silver Medal) to F. J. Paine, Dulwich Park Bakery, London, S.E. *Second Prize* (Bronze Medal) to Natural Food Co., Ltd., 305, Cambridge Road, Bethnal Green, London, E.
- Class 92—FANCY BREAD, not exceeding 4 lbs.—*First Prize* (Silver Medal) to Albion Bakeries, 125, Shirland Road, Maida Vale, London, W. *Second Prize* (Bronze Medal) to F. J. Paine.
- Class 93—HOME-MADE BREAD, 2 loaves, not exceeding 2 lbs. each. (Bakers or members of their families are not eligible to compete in this Class.)—*First Prize* (Silver Medal) to Mrs. S. A. Keirby, Hilly Laid Road, Thornton-le-Fylde. *Second Prize* (Bronze Medal) to Mrs. A. Wearing, 35, Hilden Street, Bolton.
- Class 94—TWELVE SCONES (baked on Girdle or Plate or in Oven, any shape, not exceeding 6 ozs. each, without fruit).—*First Prize* (Silver Medal) to Lawrence Witt. *Second Prize* (Bronze Medal) to Lawrence Witt.

**HONEY, WAX, &c.**

- Class 95—TWELVE JARS OF LIGHT-COLOURED EXTRACTED HONEY, 1 lb. each approximate weight.—*First Prize* (£1) to James Gladding, Bingfield, Corbridge-on-Tyne. *Second Prize* (15s.) to J. Mackenzie, Strethall, near Saffron Walden. *Third Prize* (12s. 6d.) to John Berry, The Apiary, Llanrwst, North Wales. *Fourth Prize* (10s.) to John T. Willson, York Villas, Shinebrook, Notts.
- Class 96—TWELVE JARS OF MEDIUM-COLOURED EXTRACTED HONEY (other than Heather Honey), 1 lb. each approximate weight.—*First Prize* (£1) to John Berry. *Second Prize* (15s.) to E. C. R. White, Newton Toney, near Salisbury. *Third Prize* (12s. 6d.) to Albert MacCullah, Webberton, Dunchideock, Devon. *Fourth Prize* (10s.) to James Lee & Son, Ltd., George Street, Uxbridge.
- Class 97—TWELVE JARS OF DARK-COLOURED EXTRACTED HONEY (including any variety of Heather Mixture), 1 lb. each approximate weight.—*First Prize* (15s.) to J. Pearman, Penny Long Lane, Derby. *Second Prize* (10s.) to John T. Willson.
- Class 98—TWELVE JARS OF RUN (*Ling*, *Caluna vulgaris*) HEATHER HONEY, 1 lb. each approximate weight.—*First Prize* (15s.) to J. Pearman. *Second Prize* (10s.) to M. J. Iamboll, Chiddingfold, Surrey. *Third Prize* (7s. 6d.) to William Lloyd, 2, Bank Road, Skerton, Lancaster.
- Class 99—TWELVE JARS OF GRANULATED HONEY OF 1913, or any previous year, 1 lb. each approximate weight.—*First Prize* (£1) to John Berry. *Second Prize* (10s.) to James Lee & Son, Ltd. *Third Prize* (7s. 6d.) to James Pearman.
- Class 100—TWELVE SECTIONS OF HONEY, other than Heather (size  $4\frac{1}{2}$  by  $4\frac{1}{2}$ ), 1 lb. each approximate weight.—*First Prize* (£1) to Robert Robson, Cheviot Street, Wooler, Northumberland. *Second Prize* (15s.) to James Pearman. *Third Prize* (10s.) to James Lee & Son, Ltd.
- Class 101—SIX SECTIONS OF HEATHER HONEY, 1 lb. each approximate weight.—*First Prize* (£1) to John Robson, Old Bewick Moor, Alnwick. *Second Prize* (15s.) to Robert Robson.
- Class 102—DISPLAY OF COMB AND EXTRACTED HONEY OF ANY YEAR, approximately 100 lbs. in weight, shown on a space of 8 ft. by 3 ft.—*First Prize* (£2) and *Second Prize* (£1 5s.) equally divided between James Lee & Son, Ltd. and James Pearman.
- Class 103—WAX (not less than 2 lbs., in 2 cakes only, the produce of the Exhibitor's Apiary; extracted and cleaned by the Exhibitor or his assistants).—*First*

Prize (15s.) to T. Alun Jones, Halkyn, Flintshire. *Second Prize* (10s.) to H. W. Kinnersley, Waresley, Hastlebury, Kidderminster. *Third Prize* (7s. 6d.) to James Pearman.

**Class 104—WAX** (not less than 3 lbs., the produce of the Exhibitor's Apiary, extracted and cleaned by the Exhibitor or his assistants. To be shown in shape, quality, and package suitable for the retail trade).—*First Prize* (15s.) to Fred Harris, High Ferry, Sibsey, Boston. *Second Prize* (10s.) to Albert MacCullah. *Third Prize* (7s. 6d.) to James Pearman.

**Class 105—INTERESTING AND INSTRUCTIVE EXHIBIT OF A PRACTICAL OR SCIENTIFIC NATURE**, connected with Bee Culture, not mentioned in the foregoing Classes.—*First Prize* (15s.) to Rev F. S. F. Jannings, Warmworth Rectory, Doncaster. *Second Prize* (10s.) to Albert MacCullah.

### COLONIAL HONEY.

(Produced in the Over-seas Dominions by *bona-fide* individual growers only—not merchants or Associations.)

**Class 106—TWELVE JARS OF EXTRACTED HONEY**, 1 lb. each approximate weight.—*First Prize* (Silver Medal) to Adamson & Phillips, Ngooora Apiary, Nemingha, Tamworth, New South Wales.

### ROOTS, &c.

Information must be given on the Entry Form as to the soil in which the Roots, &c., are grown; also the name of seed and manurial treatment. All Mangolds and Swedes must bear at least 3 inches of leaf, and be washed but not trimmed, oiled, or otherwise treated.

**Class 107—SIX SPECIMENS OF LONG MANGOLDS**, drawn from a crop of not less than 2 acres.—*First Prize* (£3) to Leonard J. Smith, The Scarr, Newent. *Second Prize* (£2) to William Watts, Ty-draw, Llantrithyd, Cowbridge.

**Class 108—SIX SPECIMENS OF GLOBE MANGOLDS**, drawn from a crop of not less than 2 acres.—*First Prize* (£3) to William Watts. *Second Prize* (£2) to F. Topham, Northwick Hall Farm, Worcester. *Third Prize* (£1) to John Perry, The Grange, Oswaldkirk.

**Class 109—SIX SPECIMENS OF GOLDEN OR CRIMSON TANKARD MANGOLDS**, drawn from a crop of not less than 2 acres.—*First Prize* (£3) to F. Topham. *Second Prize* (£2) to William Watts. *Third Prize* (£1) to Ernest F. Bellamy, The Moat, Newent.

**Class 110—SIX SPECIMENS OF INTERMEDIATE WHITE-FLESHED MANGOLDS**, drawn from a crop of not less than 2 acres.—*First Prize* (£3) to John Perry. *Second Prize* (£2) to F. Topham. *Third Prize* (£1) to Thomas Simpson, Bucklow Farm, Plumbley, Knutsford.

**Class 111—SIX SPECIMENS OF SWEDES, PURPLE OR BRONZE TOP**, drawn from a crop of not less than 2 acres.—*First Prize* (£3) to William Watts. *Second Prize* (£2) to A. Gregory, Saighton, Chester.

**Class 112—SIX SPECIMENS OF SWEDES, GREEN TOP**, drawn from a crop of not less than 2 acres.—*First Prize* (£3) to A. Gregory.

**Class 113—SIX SPECIMENS OF TURNIPS**, any one variety, drawn from a crop of not less than 2 acres.—*First Prize* (£3) to William Watts.

**Class 114—COLLECTION OF ROOTS, &c., FOR CATTLE FEEDING IN WINTER.** To consist of Six Specimens of not exceeding 12 varieties.—No award.

### INVENTIONS, &c.

**Class 115—ANY NEW INVENTION** relating to the Dairy Industry, or one showing distinct and practical improvement, not eligible for competition in any other Class, and not previously exhibited in competition at the Dairy Show.—*Silver Medal* to Wilts United Dairies, Ltd., Trowbridge for One Amo Milking Plant,

complete, with air pump, vacuum tank, and two machines, with latest improvements; and to J. S. Millar & Son, Engineers, Annan, N.B., for Automatic Cream Separator. *Bronze Medal* to Dairy Outfit Co., Ltd., King's Cross, London, N., for Automatic Milk Delivery Machine, with coin release; to Wolseley Sheep Shearing Machine Co., Ltd., Wolseley Separator Works, Witton, Birmingham, for one No. 2 size New Wolseley Patent Cream Separator and Milk Cleanser combined; to Abbott, Field & Co., Ltd., 106, York Road, Waterloo, London, S.E., for Railway Churn, with improved neck and cover; and to Abbott, Field & Co., Ltd., for Improved Small Cans.

**Class 116—APPLIANCE DESIGNED FOR STERILIZING MILK** by electric treatment or otherwise, but excluding methods of sterilizing milk by the aid of steam or hot water.

The apparatus must be so designed as to be continuous in action, capable of dealing with milk on a commercial scale, and easily operated by an intelligent dairyman.

In making their award the judges will take into consideration the prime cost of the plant and also of the expenses incurred in treating the milk.

Samples of milk, before and after treatment, will be submitted to the Association's Analyst and Bacteriologist, and the awards finally made on the results of their investigations. (No award.)

**Class 117—SELF-CONTAINED APPARATUS** to determine the amount of acidity in Milk, Whey, or Milk Products. Durability, cheapness, and efficiency to be taken into consideration in making awards. (No award.)

**Class 118—MILKING PAIL.** To be made of metal. The points that would be taken into consideration in making the awards are:—Cost; lightness and stability; convenience for holding by milker during milking operation; convenience for carrying away milk when milking completed; hygienic merit.—*Silver Medal* to Dairy Outfit Co., Ltd. *Bronze Medal* to Pond & Sons, Ltd., Blandford, Dorset.

### BUTTERMAKING CONTESTS.

**Class 119—Section A** (open to those who have never won a prize at any show wherever held).—*First Prize* (£3) to Miss S. A. Stephens, Tremearne, Breage, Helston. *Second Prize* (£2) to Mrs. J. T. H. Farmer, Langstone, Moreton-hampstead. *Third Prize* (£1) to Miss H. M. Moore, Munster Institute, Cork.

**Class 119—Section B.**—*First Prize* (£3) to Miss N. Furlong, Munster Institute, Cork. *Second Prize* (£2) to Miss M. Masson, Home Farm Dairy, Hatfield Park. *Third Prize* (£1) to J. E. Amos, Bridfield House Farm, Woodbridge, Suffolk.

**Class 120—Open to Students** who attended Classes at the British Dairy Institute, Reading, for not less than one month during the past two years.—*First Prize* (£3) to Miss F. M. Twose, 54, London Road, Reading. *Second Prize* (£2) to Miss M. C. Thomas, British Dairy Institute, Reading. *Third Prize* (£1) to Miss E. Bucknell, Priory Farm, Beech Hill, Reading.

**Class 121—Section A** (open to Men and Women).—*First Prize* (£3) to Miss G. B. Tuckett, Penquite, Par Station. *Second Prize* (£2) to Miss N. Parker, Nether Broomlands, Irvine. *Third Prize* (£1) to Miss H. M. Moore, Munster Institute, Cork.

**Class 121—Section B.**—*First Prize* (£3) to Miss A. Simpson, Beech Cliffe Farm, Newcastle, Staffs. *Second Prize* (£2) to Miss H. M. Trenchard, Uphay Farm, Axminster. *Third Prize* (£1) to Miss Ida Dobbs, Kingsheanton, Marwood, Barnstaple.

**Class 121—Section C.**—*First Prize* (£3) to Mrs. M. Wallace, Ocklynge Dairies, Ltd., 22, South Street, Eastbourne. *Second Prize* (£2) to Miss M. A. Dalrymple, Elliston, St. Boswells. *Third Prize* (£1) to Mrs. W. H. Wynn, Woodcote Farm, Newport, Salop.

**Class 121**—Section D.—*First Prize (£3)* to Miss E. James, Llancayo, Usk, Mon. *Second Prize (£2)* to Miss G. Lewis, Munster Institute, Cork. *Third Prize (£1)* to Miss C. Pantall, Keep Hill, Bromyard.

**Class 122**—Open to First Prize Dairy Show Winners of 1914.—*First Prize (£3)* to Miss G. B. Tuckett. *Second Prize (£2)* to Miss E. James. *Third Prize (£1)* to Mrs. M. Wallace.

**Class 123**—Champion Contest (open to Winners of First Prizes in the preceding Classes, or at the Dairy Show, 1913. Champions of any year excepted).—*First Prize* (Lord Mayor's Champion Cup, value £10 10s., and £5) to Miss G. B. Tuckett. *Second Prize (£3)* to Miss S. A. Stephens. *Third Prize (£2)* to Miss H. M. Williams, Castleton, St. Athan, Cardiff.

#### MILKERS' CONTESTS.

**Class 124**—Open to Men over 18 years. Competitors of 1910, or prior thereto, are not eligible to compete this year.—*First Prize (£5)* to Charles Fowler, Pump House, Hanbury, Droitwich. *Second Prize (£3)* to R. Fowler, Summerhill Farm, Droitwich. *Third Prize (£2)* to Stanley Foster, 2, Brfdardale Road, Mossley Hill, Liverpool.

**Class 125**—Open to Boys under 18 years.—*First Prize (£5)* to H. H. Brown, Hedges Farm, St. Albans. *Second Prize (£3)* to Thomas Loxam, The Home Farm, Burnley. *Third Prize (£2)* to W. H. Nelson, Cockerham Hall, Garstang.

**Class 126**—Open to Women over 18 years. Competitors of 1910, or prior thereto, are not eligible to compete this year.—*First Prize (£5)* to Miss E. H. Simpson, Adderley Lodge, Market Drayton. *Second Prize (£3)* to Mrs. Ellen Jones, Priory Cottage, Coton Market, Bosworth. *Third Prize (£2)* to Miss M. T. Shiell, The Dairy Byres, Pollokshaws, Glasgow.

**Class 127**—Open to Girls under 18 years.—*First Prize (£5)* to Miss Nancy Jones, New House Staunton-on-Wye. *Second Prize (£3)* to Miss C. Butler, Rabley Park, South Mimms, Barnet. *Third Prize (£2)* to Miss D. C. K. Burfitt, Goodedge Farm, North Bruham, Bruton. *Fourth Prize (£1)* to Miss M. Shepherd, Lye Holm Farm, Redhill, Bristol.

**Class 128**—Champion Contest (open to First Prize Winners in preceding Classes or at the Dairy Shows of 1912 and 1913; Champions of any year excepted).—*Gold Medal* and £5 to Miss E. H. Simpson.

**SPECIAL PRIZE.**—A case of Silver Tea Spoons, offered by Miss Ethel Everest to the Best Competitor in Class 126, being a Farmer's Wife or Daughter, providing sufficient proficiency is shown.—Awarded to Miss E. H. Simpson.

**SPECIAL PRIZE.**—A Writing Desk, offered by Miss Ethel Everest to the Best Competitor in Class 127 who is regularly engaged at Milking—Awarded to Miss N. Jones.

## HALF-YEARLY REPORT OF THE COUNCIL TO THE MEMBERS, PRESENTED TO THE MEETING HELD AT THE DAIRY SHOW, OCTOBER 21st, 1914.

THIS is the 39th Half-yearly Meeting, and the Council are gratified to be able to announce to the Members that the past six months have proved every way satisfactory in the progress of the Association. Compared with the 1,079 Annual Members on the Register at the date of the Annual Meeting in April last, there are now 1,156. Life Members total 85 against 81, and Kindred Societies to the number of 13 send Delegates to the Council Meetings.

The Devonshire Dairy Conference, which extended over eight days in May, was a huge success say those who were fortunate enough to participate in the arrangements made by the Committee. The Council are exceedingly grateful to the Local Members, Committees, and Individuals who contributed their help and generosity, and this Report is a means of sincerely thanking them on behalf of the Members, thus placing on record the appreciation which those who helped thoroughly deserve. Since the Tour, the Committee, in accordance with wishes expressed during the Tour, decided to arrange for a trip in Italy, but through the unfortunate state of War it does not appear at the present moment whether it will be possible or not to carry it through. Probably the locality for the 1915 tour will be reconsidered.

The Medal Distribution Scheme continues to be popular with Kindred Agricultural Societies and Institutions, and no doubt is beneficial to the Dairying Industry, although of expense to the Association.

Lord O'Hagan has honoured the Council by allowing his name to be submitted as its nomination for President in 1915, and your vote in support of the Council is desired, and will shortly be asked from you.

The Council lament the death of Lord Belper, one of the Association's Vice-Presidents, whose active services in the interests of the Association will be greatly missed. A list of Vice-Presidents for the ensuing year has been prepared and will be placed before you for approval.



The Council much regret the lamentable loss sustained by the Association in the death of Mr. Miles Benson, the Manager of the British Dairy Institute, Reading, and a vote of condolence and deep sympathy was expressed with his family in their bereavement. It has been decided to place on record the Association's high appreciation of his services to the science and practice of dairying; his application of science to his avocation of dairying has established a world-wide reputation which has never been reached by anyone, and the breach caused at the Institute by his death will be difficult to fill.

The following Members retire from the Council in accordance with the Articles of Association, viz. :—Mr. John Benson, Mr. Sidney Edwards, Mr. J. T. H. Farmer, Mr. W. J. Grant, Mr. James Kirby, Mr. Robert Long, Mr. C. Middleton, Mr. H. W. Middleton, Mr. William Nisbet, Mr. H. S. Holmes Pegler, Mr. B. Read, and Mr. J. H. Ross, all of whom have been nominated for re-election by outside Members, with the exception of Mr. H. W. Middleton and Mr. James Kirby, who do not seek re-election, in addition to the following new nominations, viz. :—

Col. Arthur Barham, Hole Park, Rolvenden, Kent.

Mr. Harry Cox, Great Havers Farm, Bishops Stortford.

Mr. Reginald Grant, Haverfordwest, Pem.

Mr. Tom Hunter, University College, Reading.

Mr. W. F. Jessop, Thomley Hall, Thame.

The result of the election will be declared at a later stage of this Meeting.

The Council have continued their agitation with regard to the increased rates charged by the Railway Companies for the conveyance of milk, and have obtained from the Board of Trade a Certificate to the effect that in the opinion of the Board of Trade the Association are a proper body to make complaint to the Commissioners as contemplated by the Railway and Canal Traffic Act, 1888, and the application has been filed accordingly, viz. :—

- (1) For an Order declaring that the Defendants, the South Eastern Railway Company, the London Chatham and Dover Railway Company, and the South Eastern and Chatham Railway Companies Managing Committee have not complied with the requirements of their Act of Union dated 1st August, 1899, as regards any increase in through rates and charges.

- (2) For an Order declaring that the notice of increased rates given by the Defendants, the South Eastern Railway Company, the London Chatham and Dover Railway Company, and the South Eastern and Chatham Railway Companies Managing Committee on the 15th day of May, 1913, is null, void, and of no effect, and that any increase in rates and charges levied thereunder is illegal.
- (3) For an Order declaring that the increase in rates and charges herein complained of is unreasonable, and requiring all the Defendants to desist from charging same.
- (4) For an Order directing repayment by all the Defendants of the overcharges respectively made by them in respect of the milk traffic from the 1st day of July, 1913, as indicated in paragraph 3 hereof.
- (5) For an Order requiring all the Defendants to desist from unduly preferring other traffics to the milk traffic, or otherwise subjecting the milk traffic to undue or unreasonable prejudice or disadvantage in the manner set out in paragraph 6 hereof.
- (6) For such other or further Order, Declaration, or Relief as to the Court may seem meet.

Dated this 29th day of June, 1914.

The result of the Application is still awaited by the Council.

The last Milk and Dairies Bill No. 320, has received the careful consideration of the Committee appointed by the Council to deal with its clauses, and recommendations were forwarded to the President of the Local Government Board. The Bill has been passed without some of the most important recommendations of the Council being included.

The following Resolution was passed by the Council at a recent meeting, viz. :—

In view of the large number of convictions of farmers and distributors for selling milk deficient in butter fat or non-fatty solids, although it has been proved to the satisfaction of the Magistrate that no abstraction or addition has taken place, and that therefore the milk in question was the genuine milk of the cow, the time has arrived when combined action should be taken to test the legality of these decisions, especially in view of the decision in the Scotch Court of the Appeal in the case of *Scott v. Jack*, 1912.

It was at first feared that the Thirty-ninth Annual Dairy Show, now proceeding, would have had to be cancelled, but through the energy displayed by the Executive in securing entries which compare favourably with previous years, it was decided to carry on the Show, and the outstanding features of the exhibition will be retained in full proportions. The comparative entries for the past twelve years are given below :—

	1903.	1904.	1905.	1906.	1907.	1908.
Cattle ... ..	203	164	182	240	237	247
Milking and Butter Tests ...	186	167	217	247	245	224
Goats ... ..	30	46	51	51	48	72
Poultry ... ..	2,860	2,678	3,068	3,347	3,081	3,280
Pigeons ... ..	2,485	2,426	2,440	2,573	2,664	2,764
Poultry and Pigeon Appliances ...	—	—	—	55	65	50
British Cheese ... ..	269	250	268	255	420	357
Bacon and Hams ... ..	79	46	49	39	57	76
Butter ... ..	555	556	641	578	593	668
Cream ... ..	59	44	52	42	35	47
Skim-Milk Bread, &c. ... ..	83	140	121	159	118	135
Honey, &c. ... ..	125	122	124	118	67	85
Egg and Butter Packages ...	17	20	—	—	—	—
New and Improved Inventions ...	24	43	22	17	33	37
Vehicles for Conveying Milk ...	27	25	—	—	—	—
Roots ... ..	144	184	170	156	177	181
Butter-making Contests ... ..	150	172	206	199	200	207
Milkers' Contests ... ..	36	55	66	121	135	132
	7,332	7,138	7,677	8,197	8,175	8,362
	1909.	1910.	1911.	1912.	1913.	1914.
Cattle ... ..	232	288	222	210	286	234
Milking and Butter Tests ...	236	264	213	209	265	167
Goats ... ..	84	75	81	105	110	85
Poultry ... ..	2,997	3,259	3,300	3,350	3,840	3,089
Pigeons ... ..	2,282	2,280	2,226	2,496	2,467	2,291
Poultry and Pigeon Appliances ...	37	—	—	—	—	—
British Cheese ... ..	355	362	249	343	395	301
Bacon and Hams ... ..	55	104	58	71	89	67
Butter ... ..	535	525	484	618	549	371
Cream ... ..	42	47	26	48	43	27
Skim-Milk, Bread, &c. ... ..	115	98	72	83	64	46
Honey, &c. ... ..	88	96	87	95	106	126
Egg and Butter Packages ...	—	—	—	—	—	—
New and Improved Inventions ...	31	34	21	25	41	24
Vehicles for Conveying Milk ...	—	—	—	—	—	—
Roots ... ..	218	196	172	190	190	59
Butter-making Contests ... ..	120	145	165	165	141	97
Milkers' Contests ... ..	126	122	153	119	137	85
	7,553	7,895	7,529	8,127	8,723	7,069

It was not expected that the entries would compare favourably with last year, which was a record both in number of entries and financially, but a glance at the table will reveal the fact that some departments are numerically stronger than in 1912, and particularly more so than in 1904, which was from every standpoint a successful Show, and resulted in a profit. Like most other Exhibitions it depends to a considerable extent for its financial success upon the money taken at the gates, and it is hoped that the visitors will be as numerous as on previous occasions, especially as the Show appeals to the Public solely on account of what it has to present to them in the shape of British produced necessities, and what it teaches in the methods of production of those commodities which might otherwise have been a source of national anxiety at the present moment.

By order of the Council,

FREDERICK E. HARDCASTLE,

*Secretary.*

# THIRTY=NINTH

## ANNUAL REPORT OF THE COUNCIL

to the General Meeting of Members.

Wednesday, March 31st, 1915.

The Council have pleasure in reporting that the Association during 1914 well maintained its position and usefulness. It has at the present time 1,134 Annual, 83 Life, and 5 Honorary Members, making a total of 1,222 compared with 1,210 at the corresponding period last year. There are also 14 Kindred Societies affiliated, with 15 Delegates to the Council Meetings.

Since the Half-yearly Meeting in October, the constitution of the Council has altered owing to the resignation of Mr. Tom Hunter, and the Council has re-elected Mr. Christopher Middleton, of Darlington, to fill the vacancy.

As will be seen from the financial statement appended to the Report, the resources of the Association are not so entirely satisfactory as has been the case during recent years, the reasons being the European War and the additional outlay in connection with the new offices and the fitting up thereof. The loss which resulted on both General and Show Accounts has necessitated the selling of £1,500 of Stock—viz., £1,000 2½ per cent. Consols, and £500 3 per cent. India Stock. That on General Account would not have been so great if all Members had paid their subscriptions, and it is hoped that they will yet do so.

Of the two principal events of the year, *i.e.*, the Dairy Conference in Devonshire, and the Dairy Show at the Agricultural Hall, the former gathering was attended by about 100 Members, who were afforded the most favourable opportunities of gaining an insight into the dairying methods pursued in that delightful county, the inhabitants vying with each other in facilitating these objects, and extending never-ending hospitality from start to finish. The Council desire to again record their indebtedness to those Noblemen and Gentlemen who issued invitations for the cordiality of their reception. Valuable papers were read and discussed, and are printed in the Journal, Vol. XXIX., and the entire proceedings proved eminently pleasurable and useful. Prior to the war, Italy had been fixed upon for the next Conference, but the project has since been abandoned, and no Conference will therefore take place in 1915. The Committee meet in July to decide when and where the next shall be held.

The Dairy Show was modelled on very much the same lines as those which have been previously shown to be so effective; and the prize money was increased, notably in the Cattle Section. Notwithstanding the decreased attendance on the part of the public—the gate receipts being £803 4s. less than the previous year—a loss of only £276 14s. 5d. resulted, and the number of exhibitors was 7,069 compared with 8,723 in 1913. Each year efforts have been made to introduce improvements in detail connected with the Exhibition, and the Council will not relax their efforts in their endeavours in this direction. “Business as Usual” was the motto last year, and the Members will be invited to decide at this meeting whether the Show in 1915 is to be carried out in view of the war and the loss which occurred in 1914. If a decision is come to to hold the Show, it will take place at the Royal Agricultural Hall, Islington, on October 19, 20, 21, and 22 (Tuesday till Friday), and Schedules will in due course be issued to Members and Exhibitors.

While on the subject of finance the Council desire to urge the Members to promptly pay their subscription, and would welcome any support beyond that could be generously afforded, and thus replenish the Funds which have been depleted in consequence of unforeseen difficulties arising, and over which the Council had no control.

In the management and maintenance of the British Dairy Institute, Reading, the Council continue to be associated with the authorities of the University College, in the grounds of which the Institute is situated. The lamented decease of Mr. Miles Benson, the widely-esteemed Manager of that Institution, is keenly felt, and a Memoir of him is published in the Journal. To fill the vacancy caused, and to continue his good work, the Joint Committee have secured the services of Mr. Alec Todd, the dairy instructor at the Midland Agricultural and Dairy College.

Three Examinations were held during the year for the Association's Diplomas and Certificates—two at the British Dairy Institute, and one at the County Dairy School, Chelmsford, by request of the Essex Education Committee. The following awards resulted :—

- 2 Diplomas for Proficiency in the Science and Practice of Dairy Farming and Dairying.
- 1 Teacher's Certificate for Proficiency in the Science and Practice of Dairying.
- 16 Certificates of Merit in the Theory and Practice of Cheese-making.
- 26 Certificates of Merit in the Theory and Practice of Butter-making.

The offer of the Association of Silver and Bronze Medals, under the scheme formulated in 1913, still continues to be popular with

**Kindred Societies and Educational Institutions** throughout the country. Medals, as under, were granted for the following subjects:—

			Silver.	Bronze.
Dairy Cattle ...	...	...	12	—
Butter or Cream ...	...	...	3	1
Cheese ...	...	...	3	—
Buttermaking ...	...	...	3	1
Examination ...	...	...	1	—

Realising the good which has accrued by offering these Medals, it has been decided to continue with the Scheme, in spite of the considerable expense entailed and the depletion of the Association's funds already mentioned. Forms of Application can be obtained upon application to the Secretary.

With regard to the Increased Rates charged by the Railway Companies for the transit of Milk, the Committee were successful in obtaining from the Board of Trade a Certificate to proceed before the Railway Commissioners on the lines suggested in the last Annual Report: but owing to the war the matter is in abeyance for the time being, and will be again proceeded with at the first favourable opportunity, all the Companies now being practically under Military control.

The Executive Committee of the British Section of the International Dairy Congress held various meetings prior to the Berne Meeting in July, in which several of the Members of the Section took part. Reports of the proceedings are published in the Journal, one by Mr. F. J. Lloyd, the Association's Delegate to the permanent Bureau, and another by Mr. S. R. Whitley, of Reading, who was also of the party.

The Committee appointed by the Council to consider the Milk Bill gave the subject very exhaustive consideration, and a deputation waited upon Mr. Herbert Samuels. The following resolution was passed by the Council, viz. :—

“That the Council is of opinion that the Milk and Dairies Bill introduced by the President of the Local Government Board is a decided improvement on any previous Bill, most of the objectionable features of these Bills having been removed. The Council therefore desire to give their general approval of the measure, and is glad to see that it passed its Second Reading in the House on June 9th without a division, and, subject to amendments on various points being put forward by the Agricultural Members when the Bill is in Committee, express the hope that it may be passed into law during the present session.”

The Council made various suggestions for amendments, but the Bill was passed into law without some important recommendations of the Council being included.

By order of the Council,

FREDERICK E. HARDCASTLE,

*Secretary.*





# DAIRY SHOW INCOME AND EXPENDITURE ACCOUNT for the Year ended December 31st, 1914. £s.

EXPENDITURE.			INCOME.		
1913.	£	s. d.	1913.	£	s. d.
47 9 6	Entry Fees returned	... 217 7 8	5,366 19 6	Entry Fees, Competitive and Non-Competitive	... 4,713 12 9
3240 2 3	Prizes to Exhibitors	... 2,967 15 8	392 3 11	Catalogue Sales and Advertisements	... 297 1 1
877 14 1	Sales of Exhibits	... 577 14 1	2,146 1 6	Admission Money	... 1,355 6 6
306 16 1	Wages: Clerks and Assistants	... 300 15 0	1,077 1 6	Sales of Exhibits	... 664 5 2
156 8 10	Do. Labourers	... 149 7 8	246 12 5	Sales in Working Dairies, &c.	... 206 3 4
191 10 5	Printing and Stationery	... 197 0 11	140 10 6	Contributions to Prize Fund	... 178 13 6
386 0 0	Advertising	... 419 14 0	—	Balance, being excess of Expenditure over Income	... 276 14 5
400 0 0	Rent of Royal Agricultural Hall	... 400 0 0			
420 18 5	Fittings, &c.	... 426 18 7			
89 5 5	Forage (Hay, Straw, &c.)	... 72 15 11			
97 10 0	Band	... 92 15 0			
476 13 0	Judges and Stewards' Fees	... 606 19 6			
185 19 8	Refreshments	... 168 14 9			
100 19 6	Postage	... 105 2 5			
192 14 10	Working Dairies, Milk, Cream, Ice, &c.	... 211 6 2			
197 12 3	Light, Water, &c.	... 191 11 6			
273 19 6	Catalogue	... 242 13 4			
79 12 4	Police	... 89 6 0			
33 0 0	Turnstiles	... 33 7 6			
38 0 0	Steam	... 38 0 0			
47 18 8	Signs, Headboards, &c.	... 36 15 2			
23 1 0	Decorations	... 25 1 0			
9 0 0	Clearing Hall	... 2 0 0			
37 10 0	Analyses	... 36 0 0			
26 0 8	Law Charges	... 0 7 6			
	Miscellaneous Expenses: Insurance, Auctioneer, Badges, Rosettes, Lodgings, Baskets, Boxes, Bankers' Charges, and Sundries	... 42 7 5			
219 18 4					
1,213 14 7	BALANCE, being Excess of Income over Expenditure	—	£9,369 9 4		£7,691 16 9
£9,369 9 4					

Dr.	STATEMENT OF ASSETS AND LIABILITIES, December 31st, 1914.				Cr.			
	LIABILITIES.	£	s.	d.	ASSETS.	£	s.	d.
Sundry Creditors	...	...	...	68 15 5	Investments at Cost :—			
ON ACCOUNT OF DAIRY SHOW, 1914—					£1,000 2½ per cent. Consols	938	4	10
Sundry Creditors	...	...	...	127 12 4	£1,000 L. & S. W. Railway 3 percent.			
S. P. Page. Loan Account	...	...	...	700 0 0	Debtenture Stock	...	1,046	14 8
Conference Cash	...	...	...	19 15 3	£1,000 L. & N. W. Railway 3 per cent.	887	12	6
Add	...	...	...	15 5 0	Debtenture Stock			
				35 0 3	£1,000 Metropolitan Water Board	907	13	0
				19 3 9	"B" Stock	770	14	6
Less Balance at last Account	...	...	...	15 16 6	£1,000 India 3 per cent. Stock			4,550 19 6
					Furniture	74	16	5
Surplus of Assets over Liabilities—					Add	165	3	4
As at December 31st, 1913	...	4,783	2	8		239	19	9
Deduct—Excess of Expenditure over					Less 10 per cent. depreciation	24	0	0
Income on General Account	...	544	18	7				215 19 9
				4,238 4 1	British Dairy Institute: Value of Appliances transferred to Reading			160 18 2
Deduct—Excess of Expenditure over					Sundry Debtors			88 5 0
Income on Dairy Show Account	...	276	14	5	ON ACCOUNT OF DAIRY SHOW, 1914—			
				3,961 9 8	Sales	6	0	8
Bank Overdraft...	...			342 13 6	Catalogues and Advertisements	62	14	6
					Entry Fees	91	17	0
					Prize Fund	31	1	0
					Miscellaneous	2	19	6
					Cash in hand			194 12 8
								5 12 4
				£5,216 7 5				£5,216 7 5

## REPORT OF THE AUDITORS TO THE MEMBERS OF THE BRITISH DAIRY FARMERS' ASSOCIATION.

We have audited the foregoing Income and Expenditure Accounts and Balance Sheet with the books and accounts of the Association. We have received all the information and explanations we have required. In our opinion such Balance Sheet is a full and fair Balance Sheet containing the particulars required by the Regulations of the Association, and properly drawn up so as to exhibit a true and correct view of the state of the Association's affairs according to the information and explanations we have received and as shown by the Books.

HARRY DUNN,  
FRED. RAMSAY,  
FREDK. R. WELFORD,

Auditors.

## THE British Dairy Farmers' Association.



### THE OBJECTS OF THE ASSOCIATION

are the improvement of

DAIRY STOCK AND DAIRY PRODUCE,

by encouraging the Breeding and Rearing of Stock for the special purpose of the Dairy ; a larger and more general production of Butter, Cheese, and Eggs ; the Erection of Improved Dairy Buildings, and the Invention of New or Improved Dairy Utensils, Machinery, Implements, and Scientific Appliances. The Association also stimulates the Breeding and Rearing of Poultry, &c. By means of Papers in the Society's *Journal* (published annually), Annual Conferences in different dairy districts, Lectures, and Discussions, and in other ways, efforts are continually being made to disseminate a more thorough knowledge of Dairy husbandry.

Prizes to the value of about £3,500 are annually offered for competition at the Dairy Show held at the Royal Agricultural Hall, Islington, London.

It is difficult to over-estimate the importance and need of greater attention being paid to the Dairy industry. It is admitted that by improved modes of managing Milk and its products, the wealth obtained from the Milch Cows of the country could be increased most materially. The Council, therefore, appeal to Agriculturists of all classes, and Dairy Farmers in particular, who, by becoming Members of the Association, will practically aid in developing its usefulness.

The advantages of Membership comprise :—

- 1.—A free pass to all the Society's Dairy Shows, available each day during the Exhibition, with the privilege of admitting free (by ticket) a friend on any one day.
- 2.—The privilege of participating at specially low charges in the Dairy Conferences at home or abroad, organised by the Association.
- 3.—The Exhibition of Live Stock, Dairy Produce, and Utensils, at a reduced scale of fees.
- 4.—A copy (free by post) of the *Journal* of the Association, published annually ; price 1s. to non-members.
- 5.—Analyses by the Analytical and Consulting Chemist, at low fees, of samples of milk, cream, butter, cheese, feeding stuffs, water, soil, manures, &c., and advice on dairy matters connected with his Department.

- 6.—Professional advice and assistance at a reduced scale of charges, in any case of disease among the live stock of the farm.
- 7.—Examinations of plants and seeds by the Consulting Botanist on specially low terms.
- 8.—Examinations by the Consulting Pathological Bacteriologist, for particular pathogenic or disease-producing organisms.
- 9.—Investigations by the Consulting Dairy Bacteriologist into the cause of trouble or taints in dairy produce.
- 10.—In any case of apparent hardship in connection with the administration of the Model Milk Clauses, Members are recommended to at once send details of such case to the Secretary, who will submit the matter to the Committee appointed to deal with such matters, after which, advice and assistance will be given by the Association.

The Annual Subscription is £1, but Dairy Instructors and *bonâ fide* Tenant Farmers are admitted on payment of 10s. 6d. per annum. The latter sum entitles Dairy Instructors to all privileges, except the reduced fees for exhibition at the Shows. A *bonâ fide* Tenant Farmer is deemed to be one who rents the whole of the land in his occupation.

#### MEMBERS' VETERINARY PRIVILEGES.

Members of the Association who require professional assistance in any case of disease among their animals must apply direct to the Consulting Veterinary Surgeon, Mr. SIDNEY VILLAR, F.R.C.V.S., Amersham Common, Bucks, whose scale of charge is as follows:—

	£	s.	d.
Personal Consultation ... ..	0	10	6
Post-mortem Examination and Report ... ..	0	10	6
Consultation by Letter ... ..	0	5	0
Visit and Report, in case of an outbreak of disease, in addition to personal and travelling expenses, per day ... ..	2	2	0

#### MEMBERS' BOTANICAL PRIVILEGES.

The Council have fixed the following rates of charge for the examination of Plants and Seeds for the *bonâ fide* and individual use and information of Members of the Association (not being Seedsmen), who are particularly requested to mention the kind of examination they require, and to quote its number in the subjoined Schedule.

No.	£	s.	d.
1.—A Report on the purity, and amount of nature of foreign materials, of a sample of seed ... ..	0	1	0
2.—A Report on the perfectness and germinating power of a sample of seed Nos. 1 and 2 together ... ..	0	1	6
3.—Determination of the species of any weed or other plant, or of any epiphyte or vegetable parasite, with a report on its habits, and the means for its extermination or prevention ... ..	0	1	0
4.—Report on any disease affecting farm crops ... ..	0	1	0
5.—Determination of the species of a collection of natural grasses found in any district, with a report on their habits and pasture value ...	0	4	0

*Instructions for Selecting and Sending Samples.*

The utmost care must be taken to secure a fair honest sample. When possible, at least one ounce of grass and other small seeds should be sent, and two ounces of cereals or larger seeds. Grass seeds should be sent at least four weeks, and clover seeds two weeks before they are to be used. In collecting specimens of plants, the whole plant should be taken up, and the earth shaken from the roots. If possible, the plant must be in flower or fruit. They should be packed in a light box, or in a firm paper parcel. Specimens of diseased plants or of parasites should be forwarded as fresh as possible—either in a bottle, or packed in tinfoil or oil silk. All specimens should be accompanied with a letter specifying the nature of the information required, and stating any local circumstance (soil, situation, &c.) which, in the opinion of the sender, would be likely to throw light on the inquiry.

The charge for examination must be paid, in Postage Stamps or otherwise, at the time of application, and the carriage of all parcels must be prepaid. It must be distinctly understood that *no notice can be taken* of any application unless it is accompanied by the proper fee.

## MEMBERS' CHEMICAL PRIVILEGES.

MILK (Fresh).	£	s.	d.
Estimation of Fat and Total Solids ... ..	0	2	6
Estimation of Fat, Casein, Albumin, Sugar, and Ash ... ..	0	10	6

## MILK (Sour).

Estimation of Fat and Total Solids ... ..	0	5	0
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## SKIMMED MILK.

Estimation of Fat and Total Solids ... ..	0	5	0
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## CONDENSED MILK.

Estimation of Fat ... ..	0	5	0
Estimation of Fat, Casein, and Solids .. ...	0	10	6
Estimation of Cane Sugar ... ..	0	5	0

## HUMANISED MILK.

Complete Analysis ... ..	1	1	0
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## CREAM.

Estimation of Fat ... ..	0	5	0
Estimation of Fat, Casein, and Solids .. ...	0	10	6
Examination for Foreign Fats ... ..	0	10	6

## BUTTER.

Estimation of Water, Fat, Casein, and Ash ... ..	0	10	6
Examination for Foreign Fats ... ..	0	10	6

							£	s.	d.
<b>CHEESE.</b>									
Estimation of Water, Fat, Casein, and Ash ...	...	...	...	...	...	...	0	10	6
Examination for Foreign Fats ...	...	...	...	...	...	...	0	10	6
<b>RENNET.</b>									
Examination of Strength ...	...	...	...	...	...	...	0	5	0
<b>CAKES AND MEALS</b>									
Estimation of Oil only ...	...	...	...	...	...	...	0	5	0
Estimation of Oil, Albuminoids, and Carbo-hydrates ...	...	...	...	...	...	...	0	10	6
<b>GRASS, SILAGE, ROOTS, &amp;c.</b>									
Estimation of Oil, Albuminoids, and Carbo-hydrates, &c. ...	...	...	...	...	...	...	1	1	0
<b>MANURES.</b>									
Estimation of Phosphoric Acid ...	...	...	...	...	...	...	0	5	0
Estimation of Soluble and Insoluble Phosphoric Acid ...	...	...	...	...	...	...	0	7	6
Estimation of Nitrogen ...	...	...	...	...	...	...	0	5	0
Estimation of Potash ...	...	...	...	...	...	...	0	5	0
<b>SOIL.</b>									
Estimation of Lime ...	...	...	...	...	...	...	0	5	0
Analysis and Report ...	...	...	...	...	...	...	2	2	0
<b>WATER.</b>									
Analysis for Drinking or Dairy Purposes ...	...	...	...	...	...	...	1	1	0
<b>POISONS.</b>									
Examination of a Substance for Mineral Poisons ...	...	...	...	...	...	...	2	2	0
Examination for Organic Poisons (Alkaloids, &c.) ...	...	...	...	...	...	...	3	3	0
<b>CIDER AND FERMENTED DRINKS.</b>									
Estimation of Alcohol ...	...	...	...	...	...	...	0	5	0
Estimation of Alcohol, Sugar, Acidity, &c. ...	...	...	...	...	...	...	0	10	6
<b>PRESERVATIVES.</b>									
Examining a Substance for Boracic Acid or Salicylic Acid, &c., for each Substance sought ...	...	...	...	...	...	...	0	2	6
Estimation of the quantity of Boracic Acid ...	...	...	...	...	...	...	0	10	6
Analysis of a Preservative ...	...	...	...	...	...	...	1	1	0
<b>COLOURING MATTER.</b>									
Examination for Artificial Colouring ...	...	...	...	...	...	...	0	5	0
<b>CONSULTATION</b>									
For Letter in reply to Enquiry ...	...	...	...	...	...	...	0	5	0
For Personal Interview ...	...	...	...	...	...	...	0	5	0
For Special Consultation ...	...	...	...	...	...	...	1	1	0
<b>NOTE.</b> —The Consulting Chemist will be prepared to quote reduced terms to members requiring a number of analyses at frequent intervals.									

*Instructions for Taking Fair Samples for Analysis.*

**Dairy Produce.**—Milk should be sent in a well-corked 8-oz. clear bottle. The milk should quite fill the bottle. Butter or cheese, about 8 ounces; the former in a gallipot well tied down.

**Soils.**—A block of soil about four or five inches square, and nine inches deep, should be sent in a strong box by rail.

*Artificial Manures.*—Take a handful of manure out of at least half a dozen bags, mix these rapidly and thoroughly, breaking down all lumps. Forward about a pound of the mixture in a tin box, and retain the remainder. Samples of manure should be sent immediately after the delivery of the bulk, and before settling the account. All manures should be bought subject to analysis.

*Feeding Materials.*—Feeding cakes, meals, or grains: about a pound should be sent in a bag or box. Grass and hay: a bundle of a few pounds weight. Silage: a six-inch cubic block, packed closely in a box to keep it compressed.

*Waters.*—A Winchester quart glass-stoppered bottle should be procured from a druggist, well washed out with the water, then completely filled, the stopper tied securely down, and the bottle packed in a box and sent by rail.

N.B.—In order to prevent disappointment, the Chemist requests that, as far as possible, Members desiring to hold a personal consultation should make an appointment by letter. Between 12 and 3 are the hours most convenient. The fees for analyses of artificial manures and feeding stuffs are payable in advance, and only applicable to Members who are not commercially engaged in the manufacture or sale of the articles sent for analysis. All communications intended for the Analytical and Consulting Chemist must be addressed direct to Mr. F. J. LLOYD, F.C.S., 3, New Street, Bishopsgate, London, E.C.

#### MEMBERS' BACTERIOLOGICAL PRIVILEGES.

EXAMINATIONS BY Dr. ANDREWES, Pathological Laboratory,  
St. Bartholomew's Hospital, London, E.C.

MILK.	£ s. d.		
Cultural and experimental examination for a particular pathogenic organism	...	...	2 2 0
PASTEURISED OR STERILISED MILK.			
Cultural and experimental examination for a particular pathogenic organism	...	...	1 1 0
CREAM, BUTTER, OR CHEESE.			
Cultural and experimental examination for a particular pathogenic organism	...	...	2 2 0
WATER.			
Cultural and experimental examination for a particular pathogenic organism	...	...	2 2 0

INVESTIGATIONS BY MR. F. J. LLOYD, F.C.S., 3, New Street,  
Bishopsgate, London, E.C., INTO THE CAUSES OF TROUBLE  
OR TAINTS IN MILK, CREAM, BUTTER, OR CHEESE.

MILK.	£	s.	d.
Microscopical and cultural examination for a particular organism ...	2	2	0
Experimental and cultural examination for a particular organism	£5	5	0 to 10 10 0
CREAM, BUTTER, CHEESE.			
Microscopical examination ... ..	0	10	6
Microscopical and cultural examination...	2	2	0
PASTEURISED OR STERILISED MILK.			
Microscopical examination for bacteria ... ..	0	5	0
Estimating number of bacteria present ... ..	0	10	6
Culture examination of bacteria present ... ..	2	2	0

*Directions for Sending Samples.*

Samples of milk or water (one quart) and cream (half pint) should be forwarded in wide-mouthed stoppered bottles which have previously been thoroughly cleaned, and then rinsed several times with very hot, almost boiling, water.

*Butter* is best sent in a  $\frac{1}{2}$ -lb. brick or roll, just as it was made up, wrapped in grease-proof paper, and packed in a box.

If the *Cheese* is small, send a whole one; otherwise forward a square block of not less than one pound and not a wedge-shaped piece. Wrap in grease-proof paper and pack in a box.

All samples should be sent by the speediest method possible. They ought not to arrive either on Saturday or Sunday.

Samples to be examined for disease-producing organisms should be forwarded to Dr. Andrewes, Pathological Laboratory, St. Bartholomew's Hospital, London, E.C. Members are requested to note that in the case of examination for the tubercle bacillus the method of animal inoculation, which experience has shown to be the only reliable one, will be alone used. It is impossible to carry out the process of sedimentation necessary for the detection of tubercle bacillus in milk which is received in a curdled condition. The report cannot be sent for a period of four to six weeks from the time the sample is received, but in the case of other pathogenic organisms the time required is much shorter. Samples to be examined for organisms producing taints in dairy produce should be forwarded to Mr. F. J. LLOYD, F.C.S., 3, New Street, Bishopsgate, London, E.C.



## THE BRITISH DAIRY INSTITUTE, READING.

The British Dairy Institute was established at Aylesbury in 1888, by the British Dairy Farmers' Association, and several hundred Students were successfully trained there in different branches of dairy work. In order that Students might have an opportunity of combining with the practical study of dairying a more complete scientific instruction, the Institute was, in 1896, moved to Reading, and placed under the management of a Committee representing the British Dairy Farmers Association and the University College, Reading.

The Institute contains large milk-receiving, butter-making, and milk-testing rooms; rooms for the manufacture of pressed, unpressed, and soft cheeses; and rooms for the ripening and drying of different varieties of cheese; besides reading, lecture, and common rooms. It is equipped with the best modern apparatus for the manufacture of dairy produce.

The instruction given is both practical and theoretical, and is arranged to suit the requirements of those who need either elementary or advanced dairy instruction, or who wish to perfect themselves in the manufacture of any special variety of dairy produce, including power-driven separating, pasteurizing, and butter-making plant, a steam turbine separator, and cold storage plant.

The Institute is open throughout the year, except during the Winter Vacation of eight weeks, which commences about the middle of November.

Students may join at any time and for any period.

The manufacture of hard-pressed cheeses extends from March to the end of September, but Stilton and other blue-veined varieties are not made until May.

Soft cheese making is taught during the whole of the time when the Institute is open.

During the winter months (October and November and January to March) instruction is given in buttermaking, clotted-cream making, the testing and analysis of milk, bacteriology, the management of various types of separators, the handling and care of milk, and the preparation of starters, &c. Lectures and demonstrations are usually given in the afternoons, the mornings being chiefly devoted to practical dairy work.

Practical and theoretical instruction in butter-making and cheese-making (including hard-pressed, blue-veined, and soft cheese), £1 per week; £10 for three months; £18 for six months.

Practical and theoretical instruction in buttermaking only, 10s. per week.

A full Prospectus will be sent on application to the Secretary, British Dairy Institute, Reading.

FREDERICK E. HARDCASTLE,

28, Russell Square, London.

Secretary, B.D.F.A.

# British Dairy Farmers' Association.

The following Members have sent Donations in addition to their Annual Subscription, in response to the appeal on behalf of the Funds, viz. :—

	£	s.	d.
Sir Gilbert Greenall, Bart., C.V.O. ....	30	0	0
Samuel Sanday ....	10	0	0
Lord Desborough (promised) ....	5	0	0
Victor W. Bates Van de Weyer ....	5	0	0
James Hudson ....	2	3	0
C. W. Walker-Tisdale ....	2	2	0
Joseph Rigby ....	2	2	0
B. R. Baker... ..	2	0	0
Edgar O. Boston ..	2	0	0
The Marchioness of Graham ..	2	0	0
Thomas Gibson ....	1	2	0
E. H. Clarke ....	1	1	0
A. C. Tangye ....	1	1	0
Jas. McCreath ....	1	1	0
Thos. Pettifer & Co., Ltd. ....	1	1	0
A. Andrew ... ..	1	1	0
F. E. Muntz ....	1	1	0
Ernest J. Lovell ....	1	0	0
Edwin Robson ....	1	0	0
Simpkin & James ....	1	0	0
Kenneth M. Clark ...	1	0	0
F. W. L. ....	1	0	0
John Evens ... ..	1	0	0
J. Thistleton Smith ....	1	0	0
A. A. Gatty ..	1	0	0
Isaac Butler... ..	1	0	0
Stanley Blundell ...	1	0	0
Mrs. E. M. Billson ....	1	0	0
Miss Mary Darrell ...	0	10	6
R. H. Evans ....	0	10	6
W. Wright ... ..	0	10	6
Miss A. D. McKerrow ...	0	10	6
Markham, Sons, & Co. ....	0	10	6
Miss Nellie Yeld ...	0	10	6
W. C. Brown ....	0	10	6
Miss M. C. Taylor... ..	0	10	0
Col. W. L. Simpson ....	0	10	0
Wm. Elliott... ..	0	10	0
James Lyon ... ..	0	9	6
John Ade ... ..	0	9	6
D. Burton ... ..	0	5	0
W. F. Snell ... ..	0	5	0
Miss M. E. Masson ....	0	2	0

Those Members who have not yet responded, but are now desirous of doing so, should state when remitting to the Secretary to which Fund (General or Dairy Show) they desire to devote their Donation.

# The British Dairy Farmers' Association.

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 Bedford, Geo. Smith, University College, Reading  
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 Bell, John, Cattle Gate Farm, Enfield, Middlesex  
 Bellasis, Capt. R. Oliver, Shilton House, Coventry, Warwickshire  
 Bennett, Alfred, Cote Farm, Aust, Tockington, Glos  
 Benson, John, The Kettering Dairy, Dalkeith Place, Kettering, Northampton  
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 Bernström Herr John, Aktiebolaget Separator, Stockholm (H.M.)  
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 Bertodano, Baldomero de, Cowbridge House, Malmesbury, Wilts  
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 Douglas, L. M., 3, Lauder Road, Edinburgh  
 Douglas, Thomas, Douglas Wharf, Putney, London, S.W.  
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 Drysdale, John, Scottish Agricultural Organisation Society, 5, St. Andrew Square, Edinburgh  
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 Dunn, Henry, 22, St. James' Road, Barnsbury, London, N.  
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 Bangor  
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 Edwards, J. W., Fox Hall, Oswestry, Salop  
 Edwards, Sidney, Blackbirds' Nest, Bassaleg, Newport, Mon.  
 Edwards, W. H., Brookfield Pinhoe, Devon  
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 Emberton, William, Home Farm, Doddington, Nantwich, Cheshire  
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 Emerton, H. J., Woodlands, Chase Side, Winchmore Hill, N.  
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 Lancs  
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 Farmers' and Cleveland Dairies Company, Limited (represented by J. T. Horner),  
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 Fawkes, Algernon, Wolley, Wakefield, Yorks (L.M.)  
 Fawkes, F. H., Farnley Hall, Otley, Yorks  
 Fellowes, Rt. Hon. Sir Ailwyn, K.C.V.O., Honingham, Norwich, Norfolk

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 Finch, Bernard, Flitwick, Beds  
 Fiske, George, Thornbush, Bramford, Ipswich, Suffolk  
 Fison, Joseph, & Co., Ltd. (represented by H. M. Ennals), Ipswich  
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 Ford, J. Stranger, The Manor House, Weston, Honiton  
 Ford, Walter C., 11, Carlisle Road, Eastbourne, Sussex  
 Fordham, A. R., Melbourne Bury, Royston, Herts  
 Forester, Capt. F., M.F.H., Saxelbye Park, Melton Mowbray  
 Formby, Wm., The Cedars, Stratton St. Michael, Long Stratton, Norfolk  
 Forster, Miss Jane, Dairy Institute, Worleston, Nantwich, Cheshire  
 Fortescue, Earl, Castle Hill, North Devon (L.M.)  
 Fortune, Robert, Newhouse, Cranleigh, Surrey  
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 Sutton Coldfield, Birmingham, Warwickshire  
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 Fowler and De la Perrelle (represented by T. W. Bridger), Porters Lane, near Royal  
 Pier, Southampton, Hants  
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 Freckleton, F. S., Narborough Wood, Enderby, Leicester  
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 Freeth, H. F., Cheyleswood, Langley Park, Mill Hill, London, N.W.  
 Fremlin, Walter T., Milgate Park, Maidstone, Kent  
 French, James Thomas, Crystal Palace Dairy, Norwood, S.E.  
 Friend, George B. T., Perryland, Bentley, Hants  
 Frost, Albert, Fox Farm, Sanderstead, South Croydon, Surrey  
 Frowd, Herbert H., 16, Seaside, Eastbourne, Sussex  
 Fuller, Sir J. M. F., Bart., J.P., M.P., Jaggards, Corsham, Wilts. (All com-  
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 Furse, Miss Annie, Locks Farm, Hurstpierpoint, Sussex

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 Garrard, F. R., The Hall, Framlingham, Suffolk (L.M.)  
 Gask, John, Whitefield Road, Stockton Heath, Warrington, Lancs  
 Gates, B. F. J., Wing Park, Wing, Bucks  
 Gatty, Albert A., Bannister Hall, near Preston, Lancs  
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 Godfrey, J. N., Sharpenhoe, near Ampthill, Beds  
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 Golding, W. J., Westwood Farm, Weald, Kent  
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 Goodburne, Henry Walmsley, Manor House, Althorpe, Doncaster, Yorks  
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 Goodwin, Dr. William, M.Sc., Ph.D., Midland Agricultural and Dairy College,  
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 Graham, Wm., The Willows, Marlesford, Wickham Market, Suffolk  
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 Hall, Henry H., Rye Hills, Marske-by-the-Sea, Yorks  
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 Harris, Stanley, Aspley Guise, R.S.O., Bedford (L.M.)  
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 Harrison, Thomas D., Albion Iron Works, Leigh, Lancs  
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 Hobbs, Robert W., Kelmscott, Lechlade, Gloucester

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 Hornby, F., Normanby, Hayes Avenue (King's Park), Bournemouth, Hants  
 Hornby, H. E., 12, The Quadrant, Richmond, Surrey  
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 Hughes, Jas. W., Church Farm, South Hinckley, near Oxford  
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 Hunter, Tom, Dolphinlee Farm, Lancaster  
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 Jessop, W. Frank, Thomley Hall, Thame, Oxon  
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 Jones, Miss J. I. C., Eisteddfa, Criccieth, N. Wales  
 Jones, Richard, Brumby Hall Farm, Scunthorpe, Lincolnshire  
 Jones, Selwyn, Carthage-Foy, Ross, Hereford  
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 Kirby, Frank, Warren Farm, Studley, Oxford  
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 Knowles, Miss Margaret, Chipping Dairy, Longridge, Preston

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 Lambert, Lionel F., Hewell Estate Office, Redditch, Worcs  
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 Leech, George Henry, The Greaves, Rochdale, Lancs  
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 Le Feuvre, Philip, Morville House, St. Ouen's, Jersey  
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 Lennard, Sir Henry F., Bart., Wickham Court, West Wickham, Kent  
 Leon, Sir Herbert S., Bletchley Park, Bucks  
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 Lilley, Joseph E., The Chestnuts, Wealdstone, Harrow, Middlesex (L.M.)  
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 Lister, Sir Robt. Ashton, Dursley, Gloucester  
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 Llewellyn, G. Herbert (representing G. Llewellyn & Son), Haverfordwest  
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 Lonsdale, Earl of, Lowther, Penrith, Cumberland  
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 Lovell, John Cary, 12, West Smithfield, London, E.C.  
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 Lowish, William W., Barnetby, via Lincoln  
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 Lyon, James, Wilderness Farm, Guildford, Surrey  
 Lyon, Lieut.-Col. Charles, Appleton Hall, Warrington, Cheshire (L.M.)

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 Mackintosh, James, University College, Reading, Berks  
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 Mason, Miss Madeline, County Dairy School, The Castle, Exeter  
 Masson, Miss Emmy, The Dairy Cottage, Floors Castle, Kelso, Roxburghshire  
 Masson, John, Attimore Hall Farm, Hatfield, Herts  
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 Matthews, James, Kingston Fields, Derby  
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 Pittock-Smith, Mrs. W. J., The Dairy, Yoxall, Burton-on-Trent  
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 Tong, C. J., Gt. Towbreck Farm, Hambleton, Poulton-le-Fylde, Lancs  
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 Torpedo Electric Motor Co. (represented by T. C. Edwards), 122, Hampstead Road,  
 London, N.W.  
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 Townshend, Mrs. Mildred H., Gorstage Hall, Sandiway, Cheshire  
 Trafford, Sir Humphrey de, Bart., Hill Crest, Market Harborough, Leicester (L.M.)  
 Travers, H., Middle Farm, Sutton Ditchat, Somerset  
 Trench, Col. Hon. W. le Poer, St. Hubert's, Gerrard's Cross, Bucks (L.M.)  
 Trevor, Frederick P., Bryn-ddu, Rhosgoch, Anglesey  
 Trevor, Stanley Scott, Barkstone-le-Vale, Leicestershire (L.M.)  
 Trousdell, W. B. P., Maryland, Maidstone, Kent (L.M.)  
 Turnall-Behrens, B., Porth-en-alls, Marazion, R.S.O., Cornwall  
 Turnbull, Archibald, 7, West Maitland Street, Edinburgh  
 Turnbull, Mrs. Archie, 7, West Maitland Street, Edinburgh  
 Turnbull, R. E., Ruswarp House, Ruswarp, near Whitby, Yorks (L.M.)

Turner, Miss A. J., Hortons, Cuckfield, Sussex  
 Turner, Harcourt C., Long Acre Farm, Cuckfield, Sussex  
 Tuxford & Nephews (represented by John F. Crosher), Melton Mowbray, Leicester  
 Twining, Arthur B., 225, Strand, London, W.C. (L.M.)  
 Twining, Herbert H., 222, Strand, London, W.C.

UNIAKE, A. G., Gorseley House, Upper Hardres, Canterbury, Kent  
 Upton, Edward, Coptfold Hall, Ingatestone, Essex

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 Van Haeften, Baron, Westington House, near Aylesbury, Bucks (L.M.)  
 Venner, Richard J., Westgate, London Road, Reading, Berks  
 Venner, Wm. John Day (M. Venner & Sons), Reading, Berks  
 Verdin, Wm. H., Darnhall Road, Winsford, Cheshire  
 Vernon, R., Aychley, near Market Drayton, Salop  
 Verrey, Louis C., The Warren, Oxshott, Surrey  
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 Hackney, N.E.  
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 Voelcker, Dr. J. A., 20, Upper Phillimore Gardens, Kensington, W. (L.M.)

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 Wale, Bernard N., Seale Hayne College, Newton Abbot, Devon  
 Walker, Eldred G. F., The Hollies, Chew Stoke, near Bristol, Somerset  
 Walker, Henry Faure, Highley Manor, Balcombe, Sussex  
 Walker, J. W., Normansted, Henley-on-Thames, Oxon  
 Walker, Samuel, Duncalf Farm, Hale, Altrincham, Cheshire  
 Walker, Sir Peter C., Bart., Osmaston Manor, Derby  
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 Ward, R. Bruce, Westwood Park, Droitwich, Worcester  
 Warth, Thomas Herbert, The Grange, Raunds, Wellingborough, Northants  
 Watkins, George Pearl, Culpho Hall, near Ipswich, Suffolk  
 Watney, Dr. Herbert, Buckhold, Pangbourne, Berks  
 Watson, A. E., 44, The Pryors, Hampstead, London, N.W.  
 Watson, Mrs. Helen, Bois Hall, Brentwood, Essex  
 Watt, James, J.P., Knowefield, Carlisle, Cumberland  
 Wedd, Walter James, College Farm, Meldreth, Cambridge  
 Weddell, Count, Wedellsborg, Assens, Denmark (H.M.)  
 Weightman, Albert, Middle Herrington Dairy Farm, Durham  
 Weightman, W. A., The Hall Farm, Silksworth, Durham  
 Welch, Christopher, 21, Ellerker Gardens, Richmond, Surrey (L.M.)  
 Welford, F. R., Elgin Avenue, St. Peter's Park, London, W.



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 Welford, R. W., Theberton, Mapesbury Road, Brondesbury, London, N.W.  
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 West, H. J., & Co., Ltd. (represented by Leuig Chew), 74, Gray's Inn Road,  
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 Westropp, C. H., Melford Place, Long Melford, Suffolk  
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 White, E., Double House Farm, West Tennard, Glastonbury, Somerset  
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 Whitley, Samuel R., Rookwood, Shinfield, Reading  
 Whitley, William, Primley, Paignton, S. Devon  
 Whitmore, F. H. D. C., Orsett Hall, Essex (Agent, Champion B. Russell, Manor  
 Office, Orsett, Essex)  
 Whittle, Edward J., Edwards' Creameries, Ltd., Granby House, Granby Street,  
 Hampstead Road, N.W.  
 Whittome, Herbert, Purley Oaks Farm, Purley Downs Road, Purley  
 Wickham, William, Terminus Chambers, Duke Street, London Bridge, S.E.  
 Wigmore, Frank J., 77, St. Aldate's Street, Oxford  
 Wigmore, J. R., Fritwell, Banbury, Oxon  
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 Wilkins, Walter J., Malthouse Farm, Highbury, Somerset  
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 Wilkinson, F. B., Cavendish Lodge, Edwinstowe, Notts  
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 Williams, G. P., Scorrier, Cornwall  
 Williams, J., 6, Allen Road, Stoke Newington, London, N.  
 Williams, Mrs. John, Scorrier House, Scorrier, Cornwall  
 Williams, P. D., Lanarth, St. Keverne, R.S.O., Cornwall  
 Williams, Dr. R. Stenhouse, University College, Reading, Berks  
 Williams, Miss Helena M., Castleton, St. Athan, Cardiff  
 Williams, Mrs. W. H., Walcot Dairy, Lydbury North, Shropshire  
 Willings, H., 125, Fleet Street, London, E.C.  
 Willoughby, Frank, Estate Office, Merstham, Surrey  
 Willows, Edward, 309, Gray's Inn Road, London, W.C.  
 Wills, Captain A. S., Thornby Hall, Northampton (Agent, J. R. Goodman, The  
 Lodge Farm, Thornby)  
 Wills, W., Marlwood, Thornbury, Glos  
 Wilson, A. Poole, Department of Agriculture, Upper Merrion Street, Dublin  
 Wingfield, A. H., J.P., Ampthill House, Ampthill, Beds  
 Withers, W. R., Lower Court Farm, Long Ashton, Bristol  
 Wolseley Sheep Shearing Machine Co. (represented by H. S. Hotson), Sydney  
 Works, Alma Street, Birmingham, Warwickshire  
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 Wood, John, Bourton, Totnes, Devon  
 Wood, Sir Lindsay, Bart., The Hermitage, Chester-le-Street, Durham (L.M.)  
 Wood, Wm., Courtlands, Rockfield Road, Limpsfield, Surrey  
 Woodiwise, Sam, Sedgemere Stud, Great Waltham, near Chelmsford, Essex  
 Woods, F. H., Trowle Farm, Wingfield, Trowbridge, Wilts  
 Woods, George, South Coast Dairy Co., Ltd., The Creamery, Plumpton, Sussex

Woods, Ralph, Farnborough, Hants  
 Woods, Wm. Henry, J.P., 17, Moor Park Avenue, Preston, Lancs  
 Worsfold, Edward M., 80, Cannon Street, London, E.C.  
 Wright, Alex., The Mount, Bacup, Lancs  
 Wright, Hubert, The Cliff, Morton, Bingley.  
 Wright, H. FitzHerbert, M.P., Yeldersley Hall, near Derby  
 Wright, Professor R. Patrick, Board of Agriculture for Scotland, 29, St. Andrew's Square, Edinburgh  
 Wright, S. J., & Co., Ltd. (represented by Samuel J. Wright), Taunton, Somerset  
 Wright, W., 13, Victoria Street, London, S.W.  
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 Wynn, F. V., Norlands, Westfield Road, Edgbaston, Warwick  
 Wyntner, P. M. D., Kempsey, Worcestershire  
 Wyse, Miss Ella, Shropshire Technical School for Girls, Radbrook, Shrewsbury

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 Yeld, Miss Nellie, Hereford County Council, Shirehall, Hereford  
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*N.B.—Members having any alterations to make in the Names and Addresses, as published in this List, are requested to give notice of the same, in writing, to the Secretary.*

ABBREVIATIONS—(H.M.) Honorary Member. (L.M.) Life Member.





**I. A. R. I. 75.**

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